

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced**

**San Francisco To San Jose Segment**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Segment 1 DT Terminal (6+200 7+100)		Segment 2 4th St Terminal (6+200 7+100)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		1.800		0.900	
2	Double Track Section - At-Grade	km	\$846,282	0.000	\$0	0.000	\$0
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0	0.000	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.900	\$1,440,413
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
6	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	1.800	\$1,800,517	0.000	\$0
7	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
8	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3	\$33.00	0.0	\$0	0.0	\$0
3	Total Fill	m3	\$26.00	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	0.000	\$0	0.000	\$0
8	Special Drainage Facilities	5% of Earthwork Cost			\$0		\$0
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	0	\$0	0	\$0
2	High Structure	km	\$14,043,299	0	\$0	0	\$0
3	Long Span Structure	km	\$32,020,021	0	\$0	0	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0	0	\$0
5	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0	0	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0	0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0	0	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0	0.9	\$36,905,741
13	Trench Short	km	\$42,322,835	0	\$0	0	\$0
14	Trench Long	km	\$33,464,567	0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	1.8	\$2,962,301	0.9	\$1,481,150
16	Retaining Walls	km	\$3,749,214	0	\$0	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	1.8	\$46,132,176	0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	0	\$0
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	0		0	
	Seg 3 - SFO Intermediate Station	ea	\$10,000,000	0	\$0	0	\$0
	Seg 3 - Palo Alto Intermediate Station	ea	\$10,000,000	0	\$0	0	\$0
	Seg 3 - Santa Clara Intermediate Station (Optional)	ea	\$10,000,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		1	
	Seg 2 - 4th Street Terminal Station		\$437,517,500	0	\$0	1	\$437,517,500
3	Parking - Structure	space	\$14,244	0	\$0	1960	\$27,918,240
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.900	\$682,660	0.900	\$682,660
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	12.800	\$44,788,392
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Mitigation</b>							
Environmental Mitigation		3% of Line Cost			\$1,678,506		\$15,243,959
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	1.800	\$1,297,055	0.900	\$648,527
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	1.800	\$1,072,752	0.900	\$536,376
3	Wayside Protection System	km	\$57,213	1.800	\$102,984	0.900	\$51,492
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	1.800	\$663,156	0.900	\$331,578
2	Traction Power Distribution	km	\$686,995	1.800	\$1,236,590	0.900	\$618,295
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles			\$0		\$0
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea			\$0		\$0
<b>Program Implementation Costs</b>							
Program Implementation Costs		25.5% of Total Cost and Procurement			\$14,695,318		\$144,881,903
<b>Contingencies</b>							
Contingencies		25% of Total Construction Cost			\$14,407,174		\$142,041,081
<b>Total Construction</b>					<b>\$55,950,191</b>		<b>\$508,131,974</b>
<b>Total Construction and Right of Way</b>					<b>\$57,628,697</b>		<b>\$568,164,325</b>
<b>Grand Total</b>					<b>\$86,731,189</b>		<b>\$855,087,309</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced**

**San Francisco To San Jose Segment**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
				<b>Segment 3 Common Alg (7 + 100 81 + 325)</b>	
<b>Alignment Cost</b>					
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		101.796	
2	Double Track Section - At-Grade	km	\$846,282	94.299	\$79,803,557
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	4.113	\$6,582,689
5	Double Track Section - In Trench	km	\$1,600,459	3.384	\$5,415,954
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0
2	Total Cut	m3	\$33.00	782,679	\$25,828,414
3	Total Fill	m3	\$26.00	2,761,397	\$71,796,326
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	69.676	\$6,040,005
8	Special Drainage Facilities	5% of Earthwork Cost			\$5,183,237
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749		\$0
2	High Structure	km	\$14,043,299		\$0
3	Long Span Structure	km	\$32,020,021		\$0
4	Waterway Crossing - Primary	km	\$24,606,000		\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000		\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	2.580	\$121,934,900
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	1.367	\$56,055,720
13	Trench Short	km	\$42,322,835	3.383	\$143,178,150
14	Trench Long	km	\$33,464,567	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	3.947	\$6,495,667
16	Retaining Walls	km	\$3,749,214	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	11	\$78,000,000
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	1	\$931,886
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	53	\$809,765,199
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea	N/A	2	
	Seg 3 - SFO Intermediate Station	ea	\$10,000,000	1	\$10,000,000
	Seg 3 - Palo Alto Intermediate Station	ea	\$10,000,000	1	\$10,000,000
	Seg 3 - Santa Clara Intermediate Station (Optional)	ea	\$10,000,000	0	\$0
2	Terminal Passenger Stations	ea	N/A	0	
	Seg 2 - 4th Street Terminal Station		\$437,517,500	0	\$0
3	Parking - Structure	space	\$14,244	2310	\$32,903,640
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0
3	Single Track Removal	km	\$54,000	80.025	\$4,321,350
4	Major Utility Relocations - Dense Urban	km	\$758,511	4.751	\$3,603,688
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking				
	Dense Urban	Hectares	\$3,499,093	1.900	\$6,648,277
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
<b>Environmental Mitigation</b>					
Environmental Mitigation		3% of Line Cost			\$51,758,209
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	101.796	\$73,352,764
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	101.796	\$60,667,700
3	Wayside Protection System	km	\$57,213	101.796	\$5,824,099
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	101.796	\$37,503,669
2	Traction Power Distribution	km	\$686,995	101.796	\$69,933,312
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			\$0
<b>Program Implementation Costs</b>					
Program Implementation Costs		25.5% of Total Cost and Procurement			\$454,838,429
<b>Contingencies</b>					
Contingencies		25% of Total Construction Cost			\$445,920,028
<b>Total Construction</b>					<b>\$1,725,273,627</b>
<b>Total Construction and Right of Way</b>					<b>\$1,783,680,113</b>
<b>Grand Total</b>					<b>\$2,684,438,570</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					DT Station 7th Street (Oakland) (Segment 4)		DT Station 12th Street (Oakland) (Segment 5)	
Alignment Cost								
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			9.4		9.3	
2	Double Track Section - At-Grade	km		\$846,282	3.5	\$2,961,987	2.800	\$2,369,590
3	Double Track Section - On Structure	km		\$1,600,459	0.0	\$0	0.0	\$0
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	5.9	\$9,442,710	6.5	\$10,402,985
5	Double Track Section - In Trench	km		\$1,600,459	0.0	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.0	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282	0.0	\$0	0.0	\$0
7	Freight Single Track	km		\$423,141	0.0	\$0	0.0	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0.0	\$0	0.0	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3		\$7.59	29050.0	\$220,348	23240.0	\$176,278
3	Total Fill	m3		\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares		\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km		\$86,687	3.500	\$303,405	2.800	\$242,724
8	Special Drainage Facilities	5% of Earthwork Cost				\$26,188		\$20,950
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	0.000	\$0	0.000	\$0
2	High Structure	km		\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary	km		\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589	4.000	\$189,046,357	3.000	\$141,784,767
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km		\$71,355,733	0.000	\$0	0.000	\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758	0.000	\$0	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844	0.000	\$0	0.000	\$0
11	Crossovers	ea		\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379	1.900	\$77,912,120	3.500	\$143,522,326
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	5.900	\$9,709,764	6.500	\$10,697,197
16	Retaining Walls	km		\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	1	\$14,628,436	1	\$14,628,436
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	0	\$0	0	\$0
Building Items								
1	Intermediate passenger stations - total (See Worksheet)	ea			0		0	
	Segment 6 - Oakland Airport Intermediate Station	ea		\$26,979,000	0	\$0	0	\$0
	Segment 7 - Union City Intermediate Station	ea		\$28,669,500	0	\$0	0	\$0
	Segment 8 - Union City Intermediate Station	ea		\$28,669,500	0	\$0	0	\$0
	Segment 9 - Diridon Intermediate Station	ea		\$93,437,500	0	\$0	0	\$0
	Segment 13 - Los Banos Intermediate Station - At Grade	ea		\$28,715,500	0	\$0	0	\$0
2	Terminal Passenger Stations	ea			1		1	
	Segment 4 - West Oakland Terminal Station	ea		\$335,903,500	1	\$335,903,500	0	\$0
	Segment 5 - City Center/Terminal Station	ea		\$335,903,500	0	\$0	1	\$335,903,500
3	Parking - Structure	space		\$14,244	1208	\$17,206,752	1208	\$17,206,752
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km		\$1,083,588	2.000	\$2,167,176	2.000	\$2,167,176
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	3.500	\$2,654,790	2.800	\$2,123,832
5	Major Utility Relocations - Urban	km		\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km		\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km		\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km		\$11,919	0.000	\$0	0.000	\$0
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares		\$3,499,093	3.360	\$11,756,953	2.520	\$8,817,715
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares						
	Dense Urban	Hectares		\$3,499,093	1.600	\$5,598,549	1.600	\$5,598,549
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation								
	Environmental Mitigation	3% of Line Cost				\$20,550,537		\$21,115,139
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	9.400	\$6,773,508	9.300	\$6,701,449
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	9.400	\$5,602,149	9.300	\$5,542,552
3	Wayside Protection System	km		\$57,213	9.400	\$537,806	9.300	\$532,085
Electrification Items								
1	Traction Power Supply	km		\$368,420	9.400	\$3,463,147	9.300	\$3,426,305
2	Traction Power Distribution	km		\$686,995	9.400	\$6,457,750	9.300	\$6,389,051
Vehicle Costs								
1	Fleet size estimate	vehicles				\$0		\$0
Support Facility Costs								
1	Facility cost breakdown	ea				\$0		\$0
Program Implementation Costs								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$184,345,602		\$188,539,186
Contingencies								
	Contingencies	25% of Total Construction Cost				\$180,730,982		\$184,842,339
Total Construction						\$685,017,891	\$703,837,955	
Total Construction and Right of Way						\$722,923,929	\$739,369,357	
Grand Total						\$1,088,000,514	\$1,112,750,882	

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Oakland Coliseum (Segment 6)		Hayward Line to the I-880 (San Jose) (Segment 8)	
Alignment Cost							
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		22.5		36.9	
2	Double Track Section - At-Grade	km	\$846,282	22.500	\$19,041,347	4.500	\$3,808,269
3	Double Track Section - On Structure	km	\$1,600,459	0.0	\$0	24.9	\$39,851,435
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.0	\$0	7.5	\$12,003,444
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.0	\$0	0.0	\$0
7	Freight Single Track	km	\$423,141	0.0	\$0	0.0	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.0	\$0	0.0	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3	\$7.59	186750.0	\$1,416,520	37350.0	\$283,304
3	Total Fill	m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	22.500	\$1,950,458	4.500	\$390,092
8	Special Drainage Facilities	5% of Earthwork Cost			\$168,349		\$33,670
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	0.000	\$0	20.900	\$244,587,449
2	High Structure	km	\$14,043,299	0.000	\$0	4.000	\$56,173,194
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	4.700	\$222,129,469
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0	0.000	\$0
11	Crossovers	ea	\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	2.800	\$114,817,861
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	7.500	\$12,342,920
16	Retaining Walls	km	\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	1	\$931,886
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	13	\$198,621,652	2	\$30,557,177
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	1	\$5,851,374	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	10	\$9,860,649
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
Building Items							
1	Intermediate passenger stations - total (See Worksheet)	ea		1		1	
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	1	\$26,979,000	0	\$0
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	0	\$0	0	\$0
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0	1	\$28,669,500
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0	0	\$0
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0		0	
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0	0	\$0
	Segment 5 - City Center Terminal Station	ea	\$335,903,500	0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	0	\$0	850	\$12,107,400
4	Parking - At Grade	space	\$2,042	94.000	\$191,948	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	22.500	\$24,380,727	15.000	\$16,253,818
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	22.500	\$13,043,689	29.400	\$17,043,753
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	42.550	\$99,257,608	17.700	\$41,289,299
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares					
	Dense Urban	Hectares	\$3,499,093	0	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	2.400	\$5,598,549	2.400	\$5,598,549
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$10,407,258		\$27,889,297
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	22.500	\$16,213,183	36.900	\$26,589,620
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	22.500	\$13,409,400	36.900	\$21,991,415
3	Wayside Protection System	km	\$57,213	22.500	\$1,287,302	36.900	\$2,111,176
Electrification Items							
1	Traction Power Supply	km	\$368,420	22.500	\$8,289,447	36.900	\$13,594,693
2	Traction Power Distribution	km	\$686,995	22.500	\$15,457,381	36.900	\$25,350,104
Vehicle Costs							
1	Fleet size estimate	vehicles			\$0		\$0
Support Facility Costs							
1	Facility cost breakdown	ea			\$0		\$0
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$117,853,860		\$256,127,196
Contingencies							
	Contingencies	25% of Total Construction Cost			\$115,543,000		\$251,105,094
<b>Total Construction</b>					<b>\$346,908,587</b>		<b>\$929,643,232</b>
<b>Total Construction and Right of Way</b>					<b>\$462,172,002</b>		<b>\$1,004,420,377</b>
<b>Grand Total</b>					<b>\$695,568,863</b>		<b>\$1,511,652,667</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Miles Junction to the Merced Line (San Jose ) (Segment 7)		San Jose (Segment 9)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		43.7		15.6	
2	Double Track Section - At-Grade	km	\$846,282	20.300	\$17,179,527	12.200	\$10,324,642
3	Double Track Section - On Structure	km	\$1,600,459	20.2	\$32,329,277	3.4	\$5,441,561
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	3.2	\$5,121,470	0.0	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.0	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.0	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.0	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3	\$7.59	168490.0	\$1,278,016	101260.0	\$768,069
3	Total Fill	m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	20.300	\$1,759,747	12.200	\$1,057,582
8	Special Drainage Facilities	5% of Earthwork Cost			\$151,888		\$91,283
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	14.900	\$174,370,956	0.000	\$0
2	High Structure	km	\$14,043,299	5.300	\$74,429,482	3.400	\$47,747,215
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	2.200	\$103,975,496	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0	0.000	\$0
11	Crossovers	ea	\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	1.000	\$41,006,379	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	3.200	\$5,266,313	0.000	\$0
16	Retaining Walls	km	\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	1	\$5,526,298	1	\$5,526,298
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	1	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	8	\$46,810,995	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	1	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	2	\$303,405	1	\$151,702
<b>Building Items</b>							
1	Intermediate passenger stations - total (See Worksheet)	ea		1		1	
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	0	\$0	0	\$0
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	1	\$28,669,500	0	\$0
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0	0	\$0
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0	1	\$93,437,500
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0		0	
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0	0	\$0
	Segment 5 - City Center Terminal Station	ea	\$335,903,500	0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	850	\$12,107,400	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	95	\$193,990
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	38.500	\$41,718,132	23.400	\$25,355,956
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	7.800	\$5,916,390
5	Major Utility Relocations - Urban	km	\$579,719	20.250	\$11,739,320	7.800	\$4,521,812
6	Major Utility Relocations - Dense Suburban	km	\$406,345	20.250	\$8,228,495	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	25.325	\$59,076,356	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	25.325	\$29,538,178	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares					
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	1.400	\$4,898,730
	Urban	Hectares	\$2,332,729	2.400	\$5,598,549	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Mitigation</b>							
	Environmental Mitigation	3% of Line Cost			\$23,893,154		\$7,152,880
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	43.700	\$31,489,605	15.600	\$11,241,140
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	43.700	\$26,044,034	15.600	\$9,297,184
3	Wayside Protection System	km	\$57,213	43.700	\$2,500,227	15.600	\$892,530
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	43.700	\$16,099,948	15.600	\$5,747,350
2	Traction Power Distribution	km	\$686,995	43.700	\$30,021,668	15.600	\$10,717,117
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles			\$0		\$0
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea			\$0		\$0
<b>Program Implementation Costs</b>							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$233,208,900		\$63,872,637
<b>Contingencies</b>							
	Contingencies	25% of Total Construction Cost			\$228,636,177		\$62,620,232
<b>Total Construction</b>					<b>\$796,438,471</b>		<b>\$238,429,320</b>
<b>Total Construction and Right of Way</b>					<b>\$914,544,707</b>		<b>\$250,480,930</b>
<b>Grand Total</b>					<b>\$1,376,389,785</b>		<b>\$376,973,799</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				South San Jose (Segment 10)		Revised Merced (Segment 21)	
Alignment Cost							
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		15.0		15.018	
2	Double Track Section - At-Grade	km	\$846,282	15.000	\$12,694,232	14.518	\$12,286,323.66
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0	0.500	\$800,229.63
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.0	\$0	0.0	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0	\$0.00
6	Freight Double Track	km	\$846,282	0.0	\$0	0	\$0.00
7	Freight Single Track	km	\$423,141	0.0	\$0	0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0.0	\$0	0	\$0.00
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	45.774864	\$471,210.32
2	Total Cut	m3	\$7.59	124500.0	\$944,347	442508.64	\$3,356,478.89
3	Total Fill	m3	\$7.59	0.0	\$0	442508.64	\$3,356,478.89
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	45.774864	\$314,966.90
7	Security Fencing (Both Sides of R/W)	km	\$86,687	15.000	\$1,300,305	14.518	\$1,258,522.27
8	Special Drainage Facilities	5% of Earthwork Cost			\$112,233		\$437,883
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	0.000	\$0	0.2	\$2,340,549.75
2	High Structure	km	\$14,043,299	0.000	\$0	0	\$0.00
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0	0.3	\$7,381,800.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0	0	\$0.00
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0	0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0	0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0	0	\$0.00
11	Crossovers	ea	\$80,782,844	0.000	\$0	0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0	\$0.00
13	Trench Short	km	\$42,322,835	0.000	\$0	0	\$0.00
14	Trench Long	km	\$33,464,567	0.000	\$0	0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0.00
16	Retaining Walls	km	\$3,749,214	0.000	\$0	0	\$0.00
17	Containment Walls	km	\$1,278,634	0.000	\$0	0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0	\$0.00
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0.00
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	4	\$3,727,542	0	\$0.00
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0.00
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0.00
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0.00
21	Minor crossing closures	ea	\$151,702	8	\$1,213,618	23	\$3,489,152.87
Building Items							
1	Intermediate passenger stations - total (See Worksheet)	ea		0			
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	0	\$0	0	\$0.00
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	0	\$0	0	\$0.00
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0	0	\$0.00
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0	0	\$0.00
2	Terminal Passenger Stations	ea		0			
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0	0	\$0.00
	Segment 5 - City Center/Terminal Station	ea	\$335,903,500	0	\$0	0	\$0.00
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0.00
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0.00
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0	\$0.00
2	Single Track Relocation (Permanent)	km	\$1,083,588	15.000	\$16,253,818	0	\$0.00
3	Single Track Removal	km	\$54,000	0.000	\$0	0	\$0.00
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0	\$0.00
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0	\$0.00
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0	\$0.00
7	Major Utility Relocations - Suburban	km	\$232,971	15.000	\$3,494,571	0	\$0.00
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	15.018	\$179,006.55
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0	\$0.00
	Urban	Hectares	\$2,332,729	0.000	\$0	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0	\$0.00
	Suburban	Hectares	\$408,227	0.000	\$0	0	\$0.00
	Undeveloped	Hectares	\$291,591	0.000	\$0	45.774864	\$13,347,539.92
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares					
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0	\$0.00
	Urban	Hectares	\$2,332,729	0.000	\$0	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0	\$0.00
	Suburban	Hectares	\$408,227	0.000	\$0	0	\$0.00
	Undeveloped	Hectares	\$291,591	0.000	\$0	0	\$0.00
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$2,285,354		\$2,164,624
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	15.000	\$10,808,789	15.018	\$10,821,759.33
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	15.000	\$8,939,600	15.018	\$8,950,327.26
3	Wayside Protection System	km	\$57,213	15.000	\$858,202	15.018	\$859,231.42
Electrification Items							
1	Traction Power Supply	km	\$368,420	15.000	\$5,526,298	15.018	\$5,532,929.58
2	Traction Power Distribution	km	\$686,995	15.000	\$10,304,920	15.018	\$10,317,286.34
Vehicle Costs							
1	Fleet size estimate	vehicles			\$0		\$0.00
Support Facility Costs							
1	Facility cost breakdown	ea			\$0		\$0.00
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$20,008,276		\$22,354,907
Contingencies							
	Contingencies	25% of Total Construction Cost			\$19,615,957		\$21,916,575
Total Construction					\$76,178,474		\$72,154,137
Total Construction and Right of Way					\$78,463,828		\$87,666,301
Grand Total					\$118,088,062		\$131,937,782



**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					Revised Merced (Segment 22)		Revised Merced (Segment 23)	
<b>Alignment Cost</b>								
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total		km		8.783		4.21	
2	Double Track Section - At-Grade		km	\$846,282	8.483	\$7,179,011.13	4.160	\$3,520,533.57
3	Double Track Section - On Structure		km	\$1,600,459	0.300	\$480,137.78	0.050	\$80,022.96
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.0	\$0.00	0.0	\$0.00
5	Double Track Section - In Trench		km	\$1,600,459	0	\$0.00	0	\$0.00
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0	\$0.00	0	\$0.00
6	Freight Double Track		km	\$846,282	0	\$0.00	0	\$0.00
7	Freight Single Track		km	\$423,141	0	\$0.00	0	\$0.00
9	Four-track construction or reconstruction		km	\$1,692,564	0	\$0.00	0	\$0.00
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	26.770584	\$275,578.66	12.83208	\$132,094.52
2	Total Cut		m3	\$7.59	258561.84	\$1,961,221.27	126796.8	\$961,768.30
3	Total Fill		m3	\$7.59	258561.84	\$1,961,221.27	126796.8	\$961,768.30
6	Landscape/Erosion Control		Hectares	\$6,881	26.770584	\$184,202.57	12.83208	\$88,294.76
7	Security Fencing (Both Sides of R/W)		km	\$86,687	8.483	\$735,366.06	4.160	\$360,618.04
8	Special Drainage Facilities			5% of Earthwork Cost		\$255,879		\$125,227
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	0.2	\$2,340,549.75	0	\$0.00
2	High Structure		km	\$14,043,299	0	\$0.00	0	\$0.00
3	Long Span Structure		km	\$32,020,021	0	\$0.00	0	\$0.00
4	Waterway Crossing - Primary		km	\$24,606,000	0.1	\$2,460,600.00	0.05	\$1,230,300.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0	\$0.00	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150	0	\$0.00	0	\$0.00
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	0	\$0.00	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592	0	\$0.00	0	\$0.00
8	Double Track Drill & Blast		km	\$71,355,733	0	\$0.00	0	\$0.00
9	Double Track Mined (Soft Soil)		km	\$82,012,758	0	\$0.00	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844	0	\$0.00	0	\$0.00
11	Crossovers		ea	\$80,782,844	0	\$0.00	0	\$0.00
12	Cut & Cover Double Track Tunnel		km	\$41,006,379	0	\$0.00	0	\$0.00
13	Trench Short		km	\$42,322,835	0	\$0.00	0	\$0.00
14	Trench Long		km	\$33,464,567	0	\$0.00	0	\$0.00
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0.00	0.000	\$0.00
16	Retaining Walls		km	\$3,749,214	0	\$0.00	0	\$0.00
17	Containment Walls		km	\$1,278,634	0	\$0.00	0	\$0.00
18	Single Track Cut and Cover Subway		km	\$25,628,987	0	\$0.00	0	\$0.00
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0.00	0	\$0.00
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	0	\$0.00	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	0	\$0.00	0	\$0.00
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0.00	0	\$0.00
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	0	\$0.00	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	0	\$0.00	0	\$0.00
10	Street Bridging HSR Trench		ea		0	\$0.00	0	\$0.00
21	Minor crossing closures		ea	\$151,702	16	\$2,427,236.78	11	\$1,668,725.29
<b>Building Items</b>								
1	Intermediate passenger stations - total (See Worksheet)		ea					
	Segment 6 - Oakland Airport Intermediate Station		ea	\$26,979,000	0	\$0.00	0	\$0.00
	Segment 7 - Union City Intermediate Station		ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 8 - Union City Intermediate Station		ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 9 - Diridon Intermediate Station		ea	\$93,437,500	0	\$0.00	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade		ea	\$28,715,500	0	\$0.00	0	\$0.00
2	Terminal Passenger Stations		ea					
	Segment 4 - West Oakland Terminal Station		ea	\$335,903,500	0	\$0.00	0	\$0.00
	Segment 5 - City Center/Terminal Station		ea	\$335,903,500	0	\$0.00	0	\$0.00
3	Parking - Structure		space	\$14,244	0	\$0.00	0	\$0.00
4	Parking - At Grade		space	\$2,042	0	\$0.00	0	\$0.00
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0	\$0.00	0	\$0.00
2	Single Track Relocation (Permanent)		km	\$1,083,588	0	\$0.00	0	\$0.00
3	Single Track Removal		km	\$54,000	0	\$0.00	0	\$0.00
4	Major Utility Relocations - Dense Urban		km	\$758,511	0	\$0.00	0	\$0.00
5	Major Utility Relocations - Urban		km	\$579,719	0	\$0.00	0	\$0.00
6	Major Utility Relocations - Dense Suburban		km	\$406,345	0	\$0.00	0	\$0.00
7	Major Utility Relocations - Suburban		km	\$232,971	0	\$0.00	0	\$0.00
8	Major Utility Relocations - Undeveloped		km	\$11,919	8.783	\$104,688.67	4.210	\$50,180.95
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban		Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban		Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban		Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped		Hectares	\$291,591	26.770584	\$7,806,062.27	12.83208	\$3,741,719.47
2	Right-of-Way Required for Passenger Station & Parking Facilities		Hectares					
	Dense Urban		Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban		Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban		Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban		Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped		Hectares	\$291,591	0	\$0.00	0	\$0.00
<b>Environmental Mitigation</b>								
	Environmental Mitigation			3% of Line Cost		\$1,251,037		\$582,192
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	8.783	\$6,328,906.12	4.210	\$3,033,666.72
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	8.783	\$5,234,433.64	4.210	\$2,509,047.66
3	Wayside Protection System		km	\$57,213	8.783	\$502,505.63	4.210	\$240,868.58
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	8.783	\$3,235,831.70	4.21	\$1,551,047.65
2	Traction Power Distribution		km	\$686,995	8.783	\$6,033,874.41	4.21	\$2,892,247.67
<b>Vehicle Costs</b>								
1	Fleet size estimate		vehicles			\$0.00		\$0.00
<b>Support Facility Costs</b>								
1	Facility cost breakdown		ea			\$0.00		\$0.00
<b>Program Implementation Costs</b>								
	Program Implementation Costs			25.5% of Total Cost and Procurement		\$12,943,378		\$6,051,233
<b>Contingencies</b>								
	Contingencies			25% of Total Construction Cost		\$12,689,586		\$5,932,581
<b>Total Construction</b>						<b>\$41,701,245</b>		<b>\$19,406,412</b>
<b>Total Construction and Right of Way</b>						<b>\$50,758,345</b>		<b>\$23,730,324</b>
<b>Grand Total</b>						<b>\$76,391,309</b>		<b>\$37,114,138</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Revised Merced (Segment 24)		Revised Merced (Segment 13A)	
Alignment Cost							
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		11.057		50.834	
2	Double Track Section - At-Grade	km	\$846,282	10.357	\$8,764,943.80	49.534	\$41,919,737.99
3	Double Track Section - On Structure	km	\$1,600,459	0.700	\$1,120,321.48	1.300	\$2,080,597.03
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.0	\$0.00	0.0	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0.00	0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0.00	0	\$0.00
6	Freight Double Track	km	\$846,282	0	\$0.00	0	\$0.00
7	Freight Single Track	km	\$423,141	0	\$0.00	0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0.00	0	\$0.00
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	33.701736	\$346,928.52	154.942032	\$1,594,986.38
2	Total Cut	m3	\$7.59	315681.36	\$2,394,479.40	1509796.32	\$11,451,978.61
3	Total Fill	m3	\$7.59	315681.36	\$2,394,479.40	1509796.32	\$11,451,978.61
6	Landscape/Erosion Control	Hectares	\$6,881	33.701736	\$231,894.33	154.942032	\$1,066,122.47
7	Security Fencing (Both Sides of R/W)	km	\$86,687	10.357	\$897,817.55	49.534	\$4,293,955.24
8	Special Drainage Facilities	5% of Earthwork Cost			\$313,280		\$1,492,951
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	0.3	\$3,510,824.63	0.7	\$8,191,924.13
2	High Structure	km	\$14,043,299	0	\$0.00	0	\$0.00
3	Long Span Structure	km	\$32,020,021	0	\$0.00	0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0.4	\$9,842,400.00	0.6	\$14,763,600.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.00	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.00	0	\$0.00
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0.00	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.00	0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.00	0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.00	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.00	0	\$0.00
11	Crossovers	ea	\$80,782,844	0	\$0.00	0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.00	0	\$0.00
13	Trench Short	km	\$42,322,835	0	\$0.00	0	\$0.00
14	Trench Long	km	\$33,464,567	0	\$0.00	0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0.00	0.000	\$0.00
16	Retaining Walls	km	\$3,749,214	0	\$0.00	0	\$0.00
17	Containment Walls	km	\$1,278,634	0	\$0.00	0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.00	0	\$0.00
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0.00	0	\$0.00
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0.00	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0.00	3	\$2,795,656.65
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0.00	0	\$0.00
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0.00	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0.00	0	\$0.00
10	Street Bridging HSR Trench	ea		0	\$0.00	0	\$0.00
21	Minor crossing closures	ea	\$151,702	16	\$2,427,236.78	72	\$10,922,565.50
Building Items							
1	Intermediate passenger stations - total (See Worksheet)	ea					
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	0	\$0.00	0	\$0.00
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0.00	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0.00	1	\$28,715,500.00
2	Terminal Passenger Stations	ea					
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0.00	0	\$0.00
	Segment 5 - City Center Terminal Station	ea	\$335,903,500	0	\$0.00	0	\$0.00
3	Parking - Structure	space	\$14,244	0	\$0.00	0	\$0.00
4	Parking - At Grade	space	\$2,042	0	\$0.00	47	\$95,974.00
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0.00	0	\$0.00
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0.00	0	\$0.00
3	Single Track Removal	km	\$54,000	0	\$0.00	0	\$0.00
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0.00	0	\$0.00
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0.00	0	\$0.00
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0.00	0	\$0.00
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0.00	0	\$0.00
8	Major Utility Relocations - Undeveloped	km	\$11,919	11.057	\$131,793.54	50.834	\$605,914.15
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped	Hectares	\$291,591	33.701736	\$9,827,124.05	154.942032	\$45,179,707.31
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares					
	Dense Urban	Hectares	\$3,499,093	0	\$0.00	0.000	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00	0.000	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00	0.000	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00	0.000	\$0.00
	Undeveloped	Hectares	\$291,591	0	\$0.00	26.000	\$7,581,366.88
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$1,777,078		\$7,947,862
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	11.057	\$7,967,518.50	50.834	\$36,630,264.59
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	11.057	\$6,589,676.96	50.834	\$30,295,707.56
3	Wayside Protection System	km	\$57,213	11.057	\$632,608.99	50.834	\$2,908,387.93
Electrification Items							
1	Traction Power Supply	km	\$368,420	11.057	\$4,073,618.48	50.834	\$18,728,255.58
2	Traction Power Distribution	km	\$686,995	11.057	\$7,596,100.35	50.834	\$34,922,688.35
Vehicle Costs							
1	Fleet size estimate	vehicles			\$0.00		\$0.00
Support Facility Costs							
1	Facility cost breakdown	ea			\$0.00		\$0.00
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$18,064,232		\$83,037,609
Contingencies							
	Contingencies	25% of Total Construction Cost			\$17,710,031		\$81,409,421
Total Construction					\$59,235,923		\$264,928,746
Total Construction and Right of Way					\$70,840,124		\$325,637,682
Grand Total					\$106,614,387		\$490,084,712



**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					Revised Merced (Segment 30)		Revised Merced (Segment 31)	
<b>Alignment Cost</b>								
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total		km		21.344		10.8	
2	Double Track Section - At-Grade		km	\$846,282	21.144	\$17,893,788.91	10.650	\$9,012,904.46
3	Double Track Section - On Structure		km	\$1,600,459	0.200	\$320,091.85	0.150	\$240,068.89
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.0	\$0.00	0.0	\$0.00
5	Double Track Section - In Trench		km	\$1,600,459	0	\$0.00	0	\$0.00
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0	\$0.00	0	\$0.00
6	Freight Double Track		km	\$846,282	0	\$0.00	0	\$0.00
7	Freight Single Track		km	\$423,141	0	\$0.00	0	\$0.00
9	Four-track construction or reconstruction		km	\$1,692,564	0	\$0.00	0	\$0.00
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	65.056512	\$669,697.24	32.9184	\$338,864.79
2	Total Cut		m3	\$7.59	644469.12	\$4,888,372.35	324612	\$2,462,219.33
3	Total Fill		m3	\$7.59	644469.12	\$4,888,372.35	324612	\$2,462,219.33
6	Landscape/Erosion Control		Hectares	\$6,881	65.056512	\$447,639.73	32.9184	\$226,504.36
7	Security Fencing (Both Sides of R/W)		km	\$86,687	21.144	\$1,832,910.52	10.650	\$923,216.85
8	Special Drainage Facilities			5% of Earthwork Cost		\$636,350		\$320,651
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	0	\$0.00	0	\$0.00
2	High Structure		km	\$14,043,299	0	\$0.00	0	\$0.00
3	Long Span Structure		km	\$32,020,021	0	\$0.00	0	\$0.00
4	Waterway Crossing - Primary		km	\$24,606,000	0.2	\$4,921,200.00	0.15	\$3,690,900.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0	\$0.00	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150	0	\$0.00	0	\$0.00
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	0	\$0.00	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592	0	\$0.00	0	\$0.00
8	Double Track Drill & Blast		km	\$71,355,733	0	\$0.00	0	\$0.00
9	Double Track Mined (Soft Soil)		km	\$82,012,758	0	\$0.00	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844	0	\$0.00	0	\$0.00
11	Crossovers		ea	\$80,782,844	0	\$0.00	0	\$0.00
12	Cut & Cover Double Track Tunnel		km	\$41,006,379	0	\$0.00	0	\$0.00
13	Trench Short		km	\$42,322,835	0	\$0.00	0	\$0.00
14	Trench Long		km	\$33,464,567	0	\$0.00	0	\$0.00
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0.00	0.000	\$0.00
16	Retaining Walls		km	\$3,749,214	0	\$0.00	0	\$0.00
17	Containment Walls		km	\$1,278,634	0	\$0.00	0	\$0.00
18	Single Track Cut and Cover Subway		km	\$25,628,987	0	\$0.00	0	\$0.00
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0.00	0	\$0.00
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	0	\$0.00	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	0	\$0.00	0	\$0.00
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0.00	0	\$0.00
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	0	\$0.00	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	0	\$0.00	0	\$0.00
10	Street Bridging HSR Trench		ea		0	\$0.00	0	\$0.00
21	Minor crossing closures		ea	\$151,702	42	\$6,371,496.54	22	\$3,337,450.57
<b>Building Items</b>								
1	Intermediate passenger stations - total (See Worksheet)		ea					
	Segment 6 - Oakland Airport Intermediate Station		ea	\$26,979,000	0	\$0.00	0	\$0.00
	Segment 7 - Union City Intermediate Station		ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 8 - Union City Intermediate Station		ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 9 - Diridon Intermediate Station		ea	\$93,437,500	0	\$0.00	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade		ea	\$28,715,500	0	\$0.00	0	\$0.00
2	Terminal Passenger Stations		ea					
	Segment 4 - West Oakland Terminal Station		ea	\$335,903,500	0	\$0.00	0	\$0.00
	Segment 5 - City Center/Terminal Station		ea	\$335,903,500	0	\$0.00	0	\$0.00
3	Parking - Structure		space	\$14,244	0	\$0.00	0	\$0.00
4	Parking - At Grade		space	\$2,042	0	\$0.00	0	\$0.00
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0	\$0.00	0	\$0.00
2	Single Track Relocation (Permanent)		km	\$1,083,588	0	\$0.00	0	\$0.00
3	Single Track Removal		km	\$54,000	0	\$0.00	0	\$0.00
4	Major Utility Relocations - Dense Urban		km	\$758,511	0	\$0.00	0	\$0.00
5	Major Utility Relocations - Urban		km	\$579,719	0	\$0.00	0	\$0.00
6	Major Utility Relocations - Dense Suburban		km	\$406,345	0	\$0.00	0	\$0.00
7	Major Utility Relocations - Suburban		km	\$232,971	0	\$0.00	0	\$0.00
8	Major Utility Relocations - Undeveloped		km	\$11,919	21.344	\$254,409.09	10.800	\$128,730.24
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban		Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban		Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban		Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped		Hectares	\$291,591	65.056512	\$18,969,895.60	32.9184	\$9,598,710.29
2	Right-of-Way Required for Passenger Station & Parking Facilities		Hectares					
	Dense Urban		Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban		Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban		Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban		Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped		Hectares	\$291,591	0	\$0.00	0	\$0.00
<b>Environmental Mitigation</b>								
	Environmental Mitigation			3% of Line Cost		\$2,849,187		\$1,481,369
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	21.344	\$15,380,185.85	10.800	\$7,782,327.92
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	21.344	\$12,720,454.46	10.800	\$6,436,511.81
3	Wayside Protection System		km	\$57,213	21.344	\$1,221,163.63	10.800	\$617,905.13
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	21.344	\$7,863,553.67	10.8	\$3,978,934.58
2	Traction Power Distribution		km	\$686,995	21.344	\$14,663,214.78	10.8	\$7,419,542.71
<b>Vehicle Costs</b>								
1	Fleet size estimate		vehicles			\$0.00		\$0.00
<b>Support Facility Costs</b>								
1	Facility cost breakdown		ea			\$0.00		\$0.00
<b>Program Implementation Costs</b>								
	Program Implementation Costs			25.5% of Total Cost and Procurement		\$29,781,956		\$15,417,053
<b>Contingencies</b>								
	Contingencies			25% of Total Construction Cost		\$29,197,996		\$15,114,758
<b>Total Construction</b>						<b>\$94,972,901</b>		<b>\$49,378,952</b>
<b>Total Construction and Right of Way</b>						<b>\$116,791,983</b>		<b>\$60,459,031</b>
<b>Grand Total</b>						<b>\$175,771,935</b>		<b>\$90,990,842</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Revised Merced (Segment 32)		Revised Merced (Segment 33)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		11.089		7.885	
2	Double Track Section - At-Grade	km	\$846,282	10.689	\$9,045,909.46	7.685	\$6,503,678.01
3	Double Track Section - On Structure	km	\$1,600,459	0.400	\$640,183.70	0.200	\$320,091.85
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.0	\$0.00	0.0	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0.00	0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0.00	0	\$0.00
6	Freight Double Track	km	\$846,282	0	\$0.00	0	\$0.00
7	Freight Single Track	km	\$423,141	0	\$0.00	0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0.00	0	\$0.00
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	33.799272	\$347,932.56	24.03348	\$247,402.68
2	Total Cut	m3	\$7.59	325800.72	\$2,471,235.91	234238.8	\$1,776,728.22
3	Total Fill	m3	\$7.59	325800.72	\$2,471,235.91	234238.8	\$1,776,728.22
6	Landscape/Erosion Control	Hectares	\$6,881	33.799272	\$232,565.45	24.03348	\$165,369.16
7	Security Fencing (Both Sides of R/W)	km	\$86,687	10.689	\$926,597.64	7.685	\$666,189.81
8	Special Drainage Facilities	5% of Earthwork Cost			\$322,478		\$231,621
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	0	\$0.00	0.1	\$1,170,274.88
2	High Structure	km	\$14,043,299	0	\$0.00	0	\$0.00
3	Long Span Structure	km	\$32,020,021	0	\$0.00	0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0.4	\$9,842,400.00	0.1	\$2,460,600.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.00	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.00	0	\$0.00
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0.00	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.00	0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.00	0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.00	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.00	0	\$0.00
11	Crossovers	ea	\$80,782,844	0	\$0.00	0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.00	0	\$0.00
13	Trench Short	km	\$42,322,835	0	\$0.00	0	\$0.00
14	Trench Long	km	\$33,464,567	0	\$0.00	0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0.00	0.000	\$0.00
16	Retaining Walls	km	\$3,749,214	0	\$0.00	0	\$0.00
17	Containment Walls	km	\$1,278,634	0	\$0.00	0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.00	0	\$0.00
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0.00	0	\$0.00
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0.00	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0.00	1	\$931,885.55
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0.00	0	\$0.00
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0.00	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0.00	0	\$0.00
10	Street Bridging HSR Trench	ea		0	\$0.00	0	\$0.00
21	Minor crossing closures	ea	\$151,702	14	\$2,123,832.18	10	\$1,517,022.99
<b>Building Items</b>							
1	Intermediate passenger stations - total (See Worksheet)	ea					
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	0	\$0.00	0	\$0.00
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00	0	\$0.00
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0.00	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0.00	0	\$0.00
2	Terminal Passenger Stations	ea					
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0.00	0	\$0.00
	Segment 5 - City Center/Terminal Station	ea	\$335,903,500	0	\$0.00	0	\$0.00
3	Parking - Structure	space	\$14,244	0	\$0.00	0	\$0.00
4	Parking - At Grade	space	\$2,042	0	\$0.00	0	\$0.00
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0.00	0	\$0.00
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0.00	0	\$0.00
3	Single Track Removal	km	\$54,000	0	\$0.00	0	\$0.00
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0.00	0	\$0.00
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0.00	0	\$0.00
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0.00	0	\$0.00
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0.00	0	\$0.00
8	Major Utility Relocations - Undeveloped	km	\$11,919	11.089	\$132,174.96	7.885	\$93,984.99
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped	Hectares	\$291,591	33.799272	\$9,855,564.67	24.03348	\$7,007,947.28
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares					
	Dense Urban	Hectares	\$3,499,093	0	\$0.00	0	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00	0	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00	0	\$0.00
	Undeveloped	Hectares	\$291,591	0	\$0.00	0	\$0.00
<b>Environmental Mitigation</b>							
	Environmental Mitigation	3% of Line Cost			\$1,664,814		\$1,110,472
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	11.089	\$7,990,577.25	7.885	\$5,681,819.97
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	11.089	\$6,608,748.10	7.885	\$4,699,249.60
3	Wayside Protection System	km	\$57,213	11.089	\$634,439.82	7.885	\$451,127.96
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	11.089	\$4,085,407.92	7.885	\$2,904,990.66
2	Traction Power Distribution	km	\$686,995	11.089	\$7,618,084.18	7.885	\$5,416,953.17
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles			\$0.00		\$0.00
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea			\$0.00		\$0.00
<b>Program Implementation Costs</b>							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$17,088,616		\$11,509,205
<b>Contingencies</b>							
	Contingencies	25% of Total Construction Cost			\$16,753,546		\$11,283,534
<b>Total Construction</b>					<b>\$55,493,803</b>		<b>\$37,015,719</b>
<b>Total Construction and Right of Way</b>					<b>\$67,014,182</b>		<b>\$45,134,137</b>
<b>Grand Total</b>					<b>\$100,856,344</b>		<b>\$67,926,877</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Segment 4 - Segment 16**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
				<b>Revised Merced (Segment 34)</b>	
<b>Alignment Cost</b>					
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		8.244	
2	Double Track Section - At-Grade	km	\$846,282	7.944	\$6,722,865.07
3	Double Track Section - On Structure	km	\$1,600,459	0.300	\$480,137.78
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.0	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0.00
6	Freight Double Track	km	\$846,282	0	\$0.00
7	Freight Single Track	km	\$423,141	0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0.00
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	25.127712	\$258,666.79
2	Total Cut	m3	\$7.59	242133.12	\$1,836,607.54
3	Total Fill	m3	\$7.59	242133.12	\$1,836,607.54
6	Landscape/Erosion Control	Hectares	\$6,881	25.127712	\$172,898.33
7	Security Fencing (Both Sides of R/W)	km	\$86,687	7.944	\$688,641.75
8	Special Drainage Facilities	5% of Earthwork Cost			\$239,671
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	0.3	\$3,510,824.63
2	High Structure	km	\$14,043,299	0	\$0.00
3	Long Span Structure	km	\$32,020,021	0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.00
	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.00
11	Crossovers	ea	\$80,782,844	0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.00
13	Trench Short	km	\$42,322,835	0	\$0.00
14	Trench Long	km	\$33,464,567	0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0.00
16	Retaining Walls	km	\$3,749,214	0	\$0.00
17	Containment Walls	km	\$1,278,634	0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.00
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0.00
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0.00
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	2	\$1,863,771.10
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0.00
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0.00
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0.00
10	Street Bridging HSR Trench	ea		0	\$0.00
21	Minor crossing closures	ea	\$151,702	11	\$1,668,725.29
<b>Building Items</b>					
1	Intermediate passenger stations - total (See Worksheet)	ea			
	Segment 6 - Oakland Airport Intermediate Station	ea	\$26,979,000	0	\$0.00
	Segment 7 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00
	Segment 8 - Union City Intermediate Station	ea	\$28,669,500	0	\$0.00
	Segment 9 - Diridon Intermediate Station	ea	\$93,437,500	0	\$0.00
	Segment 13 - Los Banos Intermediate Station - At Grade	ea	\$28,715,500	0	\$0.00
2	Terminal Passenger Stations	ea			
	Segment 4 - West Oakland Terminal Station	ea	\$335,903,500	0	\$0.00
	Segment 5 - City Center/Terminal Station	ea	\$335,903,500	0	\$0.00
3	Parking - Structure	space	\$14,244	0	\$0.00
4	Parking - At Grade	space	\$2,042	0	\$0.00
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0.00
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0.00
3	Single Track Removal	km	\$54,000	0	\$0.00
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0.00
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0.00
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0.00
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0.00
8	Major Utility Relocations - Undeveloped	km	\$11,919	8.244	\$98,264.08
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00
	Undeveloped	Hectares	\$291,591	25.127712	\$7,327,015.52
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares			
	Dense Urban	Hectares	\$3,499,093	0	\$0.00
	Urban	Hectares	\$2,332,729	0	\$0.00
	Dense Suburban	Hectares	\$1,166,364	0	\$0.00
	Suburban	Hectares	\$408,227	0	\$0.00
	Undeveloped	Hectares	\$291,591	0	\$0.00
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$1,182,117
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	8.244	\$5,940,510.31
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	8.244	\$4,913,204.02
3	Wayside Protection System	km	\$57,213	8.244	\$471,667.59
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	8.244	\$3,037,253.39
2	Traction Power Distribution	km	\$686,995	8.244	\$5,663,584.27
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			\$0.00
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			\$0.00
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$12,217,823
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$11,978,258
<b>Total Construction</b>					<b>\$39,403,901</b>
<b>Total Construction and Right of Way</b>					<b>\$47,913,033</b>
<b>Grand Total</b>					<b>\$72,109,115</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Bay Area - Merced**  
**Morgan Hill to Gilroy Segment**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
<b>Alignment Cost</b>					<b>Segment 11 (Morgan Hill)</b>		<b>Segment 12 (Thru Gilroy)</b>	
					<b>9+500</b>		<b>22+300</b>	
					<b>22+300</b>		<b>47+663</b>	
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total		km		12.8		25.4	
2	Double Track Section - At-Grade		km	\$846,282	7.0	\$5,923,975	16.200	\$13,709,770
3	Double Track Section - On Structure		km	\$1,600,459	5.8	\$9,282,664	6.500	\$10,402,985
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.0	\$0	2.700	\$4,321,240
5	Double Track Section - In Trench		km	\$1,600,459	0.0	\$0	0.0	\$0
6	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.0	\$0	0.0	\$0
7	Freight Double Track		km	\$846,282	0.0	\$0	0.0	\$0
8	Freight Single Track		km	\$423,141	0.0	\$0	0.0	\$0
9	Four-track construction or reconstruction		km	\$1,692,564	0.0	\$0	0.0	\$0
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	0.000	\$0	0.0	\$0
2	Total Cut		m3	\$7.59	58100.000	\$440,695	0.0	\$0
3	Total Fill		m3	\$7.59	0.000	\$0	642.475	\$4,873,247
6	Landscape/Erosion Control		Hectares	\$6,881	0.000	\$0	0.0	\$0
7	Security Fencing (Both Sides of R/W)		km	\$86,687	7.000	\$606,809	16.200	\$1,404,330
8	Special Drainage Facilities		5% of Earthwork Cost			\$52,375		\$313,879
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	0	\$0	0.0	\$0
2	High Structure		km	\$14,043,299	5.8	\$81,451,131	5.2	\$73,025,152
3	Long Span Structure		km	\$32,020,021	0	\$0	1.0	\$32,020,021
4	Waterway Crossing - Primary		km	\$24,606,000	0	\$0	0.3	\$7,381,800
5	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0	\$0	0	\$0
6	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150	0	\$0	0	\$0
7	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	0	\$0	2.700	\$127,606,291
8	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592	0	\$0	0	\$0
9	Double Track Drill & Blast		km	\$71,355,733	0	\$0	0	\$0
10	Double Track Mined (Soft Soil)		km	\$82,012,758	0	\$0	0	\$0
11	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844	0	\$0	0	\$0
12	Crossovers		ea	\$80,782,844	0	\$0	0	\$0
13	Cut & Cover Double Track Tunnel		km	\$41,006,379	0	\$0	0	\$0
14	Trench Short		km	\$42,322,835	0	\$0	0	\$0
15	Trench Long		km	\$33,464,567	0	\$0	0	\$0
16	Mechanical & Electrical for Tunnels		km	\$1,645,723	0	\$0	2.700	\$4,443,451
17	Retaining Walls		km	\$3,749,214	0	\$0	0	\$0
18	Containment Walls		km	\$1,278,634	0	\$0	0	\$0
19	Single Track Cut and Cover Subway		km	\$25,628,987	0	\$0	0	\$0
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	2	\$11,052,596	0	\$0
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	3	\$2,795,657	7	\$6,523,199
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	0	\$0	0	\$0
<b>Building Items</b>								
1	Intermediate Passenger Stations		ea				1	
	Segment 12 - Gilroy Station		ea	\$75,624,000	0	\$0	1	\$75,624,000
	Segment 14 - Morgan Hill Station (Aerial)		ea	\$166,094,500	0	\$0	0	\$0
2	Terminal Passenger Stations		ea		0	\$0	0	\$0
3	Parking - Structure		space	\$14,244	0	\$0	916	\$13,047,504
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)		km	\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban		km	\$406,345	7.680	\$3,120,733	6.810	\$2,767,212
7	Major Utility Relocations - Suburban		km	\$232,971	5.120	\$1,192,814	6.810	\$1,586,535
8	Major Utility Relocations - Undeveloped		km	\$11,919	0.000	\$0	9.080	\$108,229
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		Hectares	\$3,499,093	0.0	\$0	0.0	\$0
	Urban		Hectares	\$2,332,729	0.0	\$0	0.0	\$0
	Dense Suburban		Hectares	\$1,166,364	0.0	\$0	0.0	\$0
	Suburban		Hectares	\$408,227	0.0	\$0	5.0	\$2,041,137
	Undeveloped		Hectares	\$291,591	0.0	\$0	25.9	\$7,552,208
2	Right-of-Way Required for Passenger Station & Parking Facilities		Hectares					
	Dense Urban		Hectares	\$3,499,093	0.0	\$0	0.0	\$0
	Urban		Hectares	\$2,332,729	0.0	\$0	0.0	\$0
	Dense Suburban		Hectares	\$1,166,364	0.0	\$0	0.0	\$0
	Suburban		Hectares	\$408,227	0.0	\$0	0.7	\$285,759
	Undeveloped		Hectares	\$291,591	0.0	\$0	0.0	\$0
<b>Environmental Mitigation</b>								
	Environmental Mitigation		3% of Line Cost			\$4,410,391		\$13,225,806
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	12.800	\$9,223,500	25.400	\$18,302,882
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	12.800	\$7,628,458	25.400	\$15,137,722
3	Wayside Protection System		km	\$57,213	12.800	\$732,332	25.400	\$1,453,221
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	12.800	\$4,715,774	25.400	\$9,357,865
2	Traction Power Distribution		km	\$686,995	12.800	\$8,793,532	25.400	\$17,449,665
<b>Vehicle Costs</b>								
1	Fleet size estimate		vehicles			\$0		\$0
<b>Support Facility Costs</b>								
1	Facility cost breakdown		ea			\$0		\$0
<b>Program Implementation Costs</b>								
	Program Implementation Costs		25.5% of Total Cost and Procurement			\$38,612,976		\$118,311,103
<b>Contingencies</b>								
	Contingencies		25% of Total Construction Cost			\$37,855,859		\$115,991,278
<b>Total Construction</b>						<b>\$147,013,045</b>		<b>\$440,860,201</b>
<b>Total Construction and Right of Way</b>						<b>\$151,423,437</b>		<b>\$463,965,111</b>
<b>Grand Total</b>						<b>\$227,892,272</b>		<b>\$698,267,492</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Morgan Hill to Gilroy Segment**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>Segment 14 (Gilroy Bypass)</b>	
				<b>22+300</b>	
				<b>46+831.78</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		24.5	
2	Double Track Section - At-Grade	km	\$846,282	18.0	\$15,259,972.8
3	Double Track Section - On Structure	km	\$1,600,459	1.3	\$2,080,597.0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	5.2	\$8,322,388.1
5	Double Track Section - In Trench	km	\$1,600,459	0.0	\$0.0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.0	\$0.0
6	Freight Double Track	km	\$846,282	0.0	\$0.0
7	Freight Single Track	km	\$423,141	0.0	\$0.0
9	Four-track construction or reconstruction	km	\$1,692,564	0.0	\$0.0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0.0
2	Total Cut	m3	\$7.59	133,849	\$1,015,260.0
3	Total Fill	m3	\$7.59	925,724	\$7,021,722.9
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0.0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	18.032	\$1,563,121.4
8	Special Drainage Facilities	5% of Earthwork Cost			\$480,005
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	0	\$0.0
2	High Structure	km	\$14,043,299	0.5	\$7,021,649.3
3	Long Span Structure	km	\$32,020,021	0.5	\$16,010,010.4
4	Waterway Crossing - Primary	km	\$24,606,000	0.3	\$7,381,800.0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	5.2	\$245,760,263.6
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.0
11	Crossovers	ea	\$80,782,844	0	\$0.0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.0
13	Trench Short	km	\$42,322,835	0	\$0.0
14	Trench Long	km	\$33,464,567	0	\$0.0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	5.2	\$8,557,757.9
16	Retaining Walls	km	\$3,749,214	0	\$0.0
17	Containment Walls	km	\$1,278,634	0	\$0.0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	4	\$3,727,542
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea		1	
	Segment 12 - Gilroy Station	ea	\$75,624,000	0	\$0.0
	Segment 14 - Morgan Hill Station (Aerial)	ea	\$166,094,500	1	\$166,094,500.0
2	Terminal Passenger Stations	ea		0	
3	Parking - Structure	space	\$14,244	916	\$13,047,504.0
4	Parking - At Grade	space	\$2,042	0	\$0.0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0.0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0.0
3	Single Track Removal	km	\$54,000	0.000	\$0.0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0.0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0.0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0.0
7	Major Utility Relocations - Suburban	km	\$232,971	3.866	\$900,750.3
8	Major Utility Relocations - Undeveloped	km	\$11,919	15.465	\$184,339.6
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0.0	\$0.0
	Urban	Hectares	\$2,332,729	0.0	\$0.0
	Dense Suburban	Hectares	\$1,166,364	0.0	\$0.0
	Suburban	Hectares	\$408,227	13.0	\$5,306,956.8
	Undeveloped	Hectares	\$291,591	70.0	\$20,411,372.4
2	Right-of-Way Required for Passenger Station & Parking Facilities	Hectares			
	Dense Urban	Hectares	\$3,499,093	0.0	\$0.0
	Urban	Hectares	\$2,332,729	0.0	\$0.0
	Dense Suburban	Hectares	\$1,166,364	0.7	\$816,455.1
	Suburban	Hectares	\$408,227	0.0	\$0.0
	Undeveloped	Hectares	\$291,591	0.0	\$0.0
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$17,009,390
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	24.532	\$17,677,255.2
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	24.532	\$14,620,286.3
3	Wayside Protection System	km	\$57,213	24.532	\$1,403,547.5
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	24.532	\$9,037,995.2
2	Traction Power Distribution	km	\$686,995	24.532	\$16,853,202.7
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			\$0
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$155,683,579
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$152,630,960
<b>Total Construction</b>					<b>\$566,979,667</b>
<b>Total Construction and Right of Way</b>					<b>\$610,523,841</b>
<b>Grand Total</b>					<b>\$918,838,380</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Bay Area - Merced**  
**Mountain Crossing**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
<b>Alignment Cost</b>					<b>Segment 12 to SR-152 Connection</b>		<b>SR-152 Alignment Option</b>	
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km			3.52		33.81	
2	Double Track Section - At-Grade	km		\$846,282	3.52	\$2,980,606	19.76	\$16,720,830
3	Double Track Section - On Structure	km		\$1,600,459	0.00	\$0	0.20	\$320,092
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.00	\$0	13.85	\$22,166,384
5	Double Track Section - In Trench	km		\$1,600,459	0	\$0	0	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0	\$0	0	\$0
6	Freight Double Track	km		\$846,282	0	\$0	0	\$0
7	Freight Single Track	km		\$423,141	0	\$0	0	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0	\$0	0	\$0
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped	Hectares		\$10,294	33.43	\$344,099	286.79	\$2,952,277
2	Total Cut	m3		\$7.59	1341914	\$10,178,572	45302029	\$343,621,099
3	Total Fill	m3		\$7.59	2032203	\$15,414,490	14248569	\$108,077,037
6	Landscape/Erosion Control	Hectares		\$6,881	33.43	\$230,003	286.79	\$1,973,364
7	Security Fencing (Both Sides of R/W)	km		\$86,687	3.52	\$305,312	19.76	\$1,712,761
8	Special Drainage Facilities	5% of Earthwork Cost				\$1,323,624		\$22,916,827
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure	km		\$11,702,749	0	\$0	0	\$0
2	High Structure	km		\$14,043,299	0	\$0	0	\$0
3	Long Span Structure	km		\$32,020,021	0	\$0	0.100	\$3,202,002
4	Waterway Crossing - Primary	km		\$24,606,000	0	\$0	0.100	\$2,460,600
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150	0	\$0	0	\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589	0	\$0	13.850	\$654,573,693
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592	0	\$0	0	\$0
8	Double Track Drill & Blast	km		\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea		\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379	0	\$0	0	\$0
13	Trench Short	km		\$42,322,835	0	\$0	0	\$0
14	Trench Long	km		\$33,464,567	0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.00	\$0	13.850	\$22,793,283
16	Retaining Walls	km		\$3,749,214	0	\$0	0	\$0
17	Containment Walls	km		\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0	\$0	0	\$0
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	0	\$0	0	\$0
<b>Building Items</b>								
1	Intermediate Passenger Stations	ea						
2	Terminal Passenger Stations	ea						
3	Parking - Structure	space		\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)	km		\$1,083,588	0	\$0	0	\$0
2	Single Track Relocation (Permanent)	km		\$1,083,588	0	\$0	0	\$0
3	Single Track Removal	km		\$54,000	0	\$0	0	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0	\$0	0	\$0
5	Major Utility Relocations - Urban	km		\$579,719	0	\$0	0	\$0
6	Major Utility Relocations - Dense Suburban	km		\$406,345	0	\$0	0	\$0
7	Major Utility Relocations - Suburban	km		\$232,971	0	\$0	0	\$0
8	Major Utility Relocations - Undeveloped	km		\$11,919	3.522	\$41,980	19.958	\$237,889
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares		\$3,499,093	0	\$0	0	\$0
	Urban	Hectares		\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares		\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares		\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares		\$291,591	10.735056	\$3,130,246	103.046784	\$30,047,518
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	Hectares		\$3,499,093	0	\$0	0	\$0
	Urban	Hectares		\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares		\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares		\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares		\$291,591	0	\$0	0	\$0
<b>Environmental Mitigation</b>								
	Environmental Mitigation	3% of Line Cost			N/A	\$1,181,228	N/A	\$38,575,623
<b>Signals and Communication</b>								
1	Signaling (ATC)	km		\$720,586	3.52	\$2,537,904	33.808	\$24,361,569
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	3.52	\$2,099,018	33.808	\$20,148,666
3	Wayside Protection System	km		\$57,213	3.52	\$201,506	33.808	\$1,934,272
<b>Electrification Items</b>								
1	Traction Power Supply	km		\$368,420	3.52	\$1,297,575	33.808	\$12,455,539
2	Traction Power Distribution	km		\$686,995	3.52	\$2,419,595	33.808	\$23,225,917
<b>Vehicle Costs</b>								
1	Fleet size estimate	vehicles		44000000		0		\$0
<b>Support Facility Costs</b>								
1	Facility cost breakdown	ea		0		0		\$0
<b>Program Implementation Costs</b>								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$11,139,868		\$345,391,697
<b>Contingencies</b>								
	Contingencies	25% of Total Construction Cost				\$10,921,439		\$338,619,310
<b>Total Construction</b>						<b>\$39,374,282</b>		<b>\$1,285,854,100</b>
<b>Total Construction and Right of Way</b>						<b>\$43,685,757</b>		<b>\$1,354,477,241</b>
<b>Grand Total</b>						<b>\$65,747,064</b>		<b>\$2,038,488,248</b>



**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Mountain Crossing**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					Northern Alignment Option		Minimize Tunnel Option	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			72.68		71.46	
2	Double Track Section - At-Grade	km	\$846,282		37.64	\$31,857,564	40.93	\$34,640,653
3	Double Track Section - On Structure	km	\$1,600,459		4.95	\$7,922,273	4.65	\$7,442,136
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459		30.08	\$48,144,788	25.88	\$41,417,087
5	Double Track Section - In Trench	km	\$1,600,459		0	\$0	0	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287		0	\$0	0	\$0
6	Freight Double Track	km	\$846,282		0	\$0	0	\$0
7	Freight Single Track	km	\$423,141		0	\$0	0	\$0
9	Four-track construction or reconstruction	km	\$1,692,564		0	\$0	0	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares	\$10,294		405.658	\$4,175,881	499.032	\$5,137,074
2	Total Cut	m3	\$7.59		45567510	\$345,634,800	66869321	\$507,211,482
3	Total Fill	m3	\$7.59		15662449	\$118,801,473	28158449	\$213,585,073
6	Landscape/Erosion Control	Hectares	\$6,881		405.658	\$2,791,247	499.032	\$3,433,728
7	Security Fencing (Both Sides of R/W)	km	\$86,687		37.64	\$3,263,259	40.93	\$3,548,338
8	Special Drainage Facilities	5% of Earthwork Cost				\$23,733,333		\$36,645,785
Structures/Tunnels/Walls								
1	Standard Structure	km	\$11,702,749		0.200	\$2,340,550	0.100	\$1,170,275
2	High Structure	km	\$14,043,299		4.000	\$56,173,194	4.100	\$57,577,524
3	Long Span Structure	km	\$32,020,021		0.500	\$16,010,010	0.250	\$8,005,005
4	Waterway Crossing - Primary	km	\$24,606,000		0.250	\$6,151,500	0.200	\$4,921,200
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000		0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		0	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		30.082	\$1,421,716,416	25.878	\$1,223,047,291
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733		0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		0	\$0	0	\$0
11	Crossovers	ea	\$80,782,844		0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		0	\$0	0	\$0
13	Trench Short	km	\$42,322,835		0	\$0	0	\$0
14	Trench Long	km	\$33,464,567		0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723		30.082	\$49,506,396	25.878	\$42,588,425
16	Retaining Walls	km	\$3,749,214		0	\$0	0	\$0
17	Containment Walls	km	\$1,278,634		0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987		0	\$0	0	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436		0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298		0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886		0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589		0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374		0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065		0	\$0	0	\$0
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702		0	\$0	0	\$0
Building Items								
1	Intermediate Passenger Stations	ea						
2	Terminal Passenger Stations	ea						
3	Parking - Structure	space	\$14,244		0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042		0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km	\$1,083,588		0	\$0	0	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588		0	\$0	0	\$0
3	Single Track Removal	km	\$54,000		0	\$0	0	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511		0	\$0	0	\$0
5	Major Utility Relocations - Urban	km	\$579,719		0	\$0	0	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345		0	\$0	0	\$0
7	Major Utility Relocations - Suburban	km	\$232,971		0	\$0	0	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919		42.594	\$507,699	45.583	\$543,322
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares	\$3,499,093		0	\$0	0	\$0
	Urban	Hectares	\$2,332,729		0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364		0	\$0	0	\$0
	Suburban	Hectares	\$408,227		0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591		221.516448	\$64,592,210	217.813128	\$63,512,355
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	Hectares	\$3,499,093		0	\$0	0	\$0
	Urban	Hectares	\$2,332,729		0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364		0	\$0	0	\$0
	Suburban	Hectares	\$408,227		0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591		0	\$0	0	\$0
Environmental Mitigation								
Environmental Mitigation		3% of Line Cost			N/A	\$69,458,220	N/A	\$70,935,196
Signals and Communication								
1	Signaling (ATC)	km	\$720,586		72.676	\$52,369,302	71.461	\$51,493,790
2	Communications (w/Fiber Optic Backbone)	km	\$595,973		72.676	\$43,312,957	71.461	\$42,588,849
3	Wayside Protection System	km	\$57,213		72.676	\$4,158,044	71.461	\$4,088,530
Electrification Items								
1	Traction Power Supply	km	\$368,420		72.676	\$26,775,282	71.461	\$26,327,652
2	Traction Power Distribution	km	\$686,995		72.676	\$49,928,026	71.461	\$49,093,328
Vehicle Costs								
1	Fleet size estimate	vehicles	44000000			\$0		\$0
Support Facility Costs								
1	Facility cost breakdown	ea	0			\$0		\$0
Program Implementation Costs								
Program Implementation Costs		25.5% of Total Cost and Procurement				\$624,577,728		\$637,233,295
Contingencies								
Contingencies		25% of Total Construction Cost				\$612,331,106		\$624,738,525
Total Construction						\$2,315,273,994	\$2,364,506,547	
Total Construction and Right of Way						\$2,449,324,424	\$2,498,954,099	
Grand Total						\$3,686,233,259	\$3,760,925,919	

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bay Area - Merced  
Mountain Crossing**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
<b>Alignment Cost</b>				<b>Tunnel under Park Option</b>		<b>Segment 16A</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		71.35		4.42	
2	Double Track Section - At-Grade	km	\$846,282	35.68	\$30,192,198	4.42	\$3,743,952
3	Double Track Section - On Structure	km	\$1,600,459	4.10	\$6,561,883	0.00	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	31.57	\$50,532,452	0.00	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0	0	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0	0	\$0
6	Freight Double Track	km	\$846,282	0	\$0	0	\$0
7	Freight Single Track	km	\$423,141	0	\$0	0	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0	0	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	377.317	\$3,884,133	13.484352	\$138,809
2	Total Cut	m3	\$7.59	39659109	\$300,818,898	134843.52	\$1,022,804
3	Total Fill	m3	\$7.59	24110048	\$182,877,483	134843.52	\$1,022,804
6	Landscape/Erosion Control	Hectares	\$6,881	377.317	\$2,596,236	13.484352	\$92,783
7	Security Fencing (Both Sides of R/W)	km	\$86,687	35.68	\$3,092,671	4.42	\$383,503
8	Special Drainage Facilities	5% of Earthwork Cost			\$24,663,471		\$133,035
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	0.100	\$1,170,275	0.000	\$0
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	3.900	\$124,878,081	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0.100	\$2,460,600	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	31.574	\$1,492,224,180	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0	0	\$0
13	Trench Short	km	\$42,322,835	0	\$0	0	\$0
14	Trench Long	km	\$33,464,567	0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	31.57	\$51,961,587	0.00	\$0
16	Retaining Walls	km	\$3,749,214	0	\$0	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0	0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	9	\$1,365,321
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea					
2	Terminal Passenger Stations	ea					
3	Parking - Structure	space	\$14,244	0	\$0	\$0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	\$0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0	\$0	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0	\$0	\$0
3	Single Track Removal	km	\$54,000	0	\$0	\$0	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0	\$0	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0	\$0	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0	\$0	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0	\$0	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	39.776	\$474,112	4.424	\$52,732
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0	\$0	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares	\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591	217.4748	\$63,413,702	13.484352	\$3,931,916
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0	\$0	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares	\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591	0	\$0	0	\$0
<b>Environmental Mitigation</b>							
	Environmental Mitigation	3% of Line Cost		N/A	\$73,551,323		\$561,074
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	71.350	\$51,413,805	4.424	\$3,187,872
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	71.350	\$42,522,696	4.424	\$2,636,586
3	Wayside Protection System	km	\$57,213	71.350	\$4,082,179	4.424	\$253,112
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	71.350	\$26,286,758	4.424	\$1,629,889
2	Traction Power Distribution	km	\$686,995	71.350	\$49,017,072	4.424	\$3,039,265
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles	44000000		\$0		\$0
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea	0		\$0		\$0
<b>Program Implementation Costs</b>							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$660,112,328		\$5,914,841
<b>Contingencies</b>							
	Contingencies	25% of Total Construction Cost			\$647,168,949		\$5,798,864
<b>Total Construction</b>					<b>\$2,451,710,769</b>		<b>\$18,702,466</b>
<b>Total Construction and Right of Way</b>					<b>\$2,588,675,794</b>		<b>\$23,195,457</b>
<b>Grand Total</b>					<b>\$3,895,957,070</b>		<b>\$34,909,162</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Bay Area - Merced**  
**Mountain Crossing**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					Segment 17		Segment 18	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		13.72			7.988	
2	Double Track Section - At-Grade	km	\$846,282	13.22	\$11,187,849		7.89	\$6,675,473.28
3	Double Track Section - On Structure	km	\$1,600,459	0.50	\$800,230		0.10	\$160,045.93
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.00	\$0		0.00	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0		0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0		0	\$0.00
6	Freight Double Track	km	\$846,282	0	\$0		0	\$0.00
7	Freight Single Track	km	\$423,141	0	\$0		0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0		0	\$0.00
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares	\$10,294	41.81856	\$430,483.79		24.347424	\$250,634.44
2	Total Cut	m3	\$7.59	402945.6	\$3,056,388.69		240426.24	\$1,823,660.66
3	Total Fill	m3	\$7.59	402945.6	\$3,056,388.69		240426.24	\$1,823,660.66
6	Landscape/Erosion Control	Hectares	\$6.881	41.81856	\$287,744.43		24.347424	\$167,529.34
7	Security Fencing (Both Sides of R/W)	km	\$86,687	13.22	\$1,146,002.51		7.89	\$683,787.28
8	Special Drainage Facilities	5% of Earthwork Cost			\$398,850			\$237,464
Structures/Tunnels/Walls								
1	Standard Structure	km	\$11,702,749	0.3	\$3,510,824.63		0.1	\$1,170,274.88
2	High Structure	km	\$14,043,299	0	\$0.00		0	\$0.00
3	Long Span Structure	km	\$32,020,021	0	\$0.00		0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0.2	\$4,921,200.00		0	\$0.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.00		0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.00		0	\$0.00
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0.00		0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.00		0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.00		0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.00		0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.00		0	\$0.00
11	Crossovers	ea	\$80,782,844	0	\$0.00		0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.00		0	\$0.00
13	Trench Short	km	\$42,322,835	0	\$0.00		0	\$0.00
14	Trench Long	km	\$33,464,567	0	\$0.00		0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.00	\$0.00		0.00	\$0.00
16	Retaining Walls	km	\$3,749,214	0	\$0.00		0	\$0.00
17	Containment Walls	km	\$1,278,634	0	\$0.00		0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.00		0	\$0.00
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0		0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0		0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0		0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0		0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0		0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0		0	\$0
10	Street Bridging HSR Trench	ea		0	\$0		0	\$0
21	Minor crossing closures	ea	\$151,702	25	\$3,792,557		9	\$1,365,321
Building Items								
1	Intermediate Passenger Stations	ea						
2	Terminal Passenger Stations	ea						
3	Parking - Structure	space	\$14,244	0	\$0		0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0		0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0		0	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0		0	\$0
3	Single Track Removal	km	\$54,000	0	\$0		0	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0		0	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0		0	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0		0	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0		0	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	13.720	\$163,535		7.988	\$95,213
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares	\$3,499,093	0	\$0		0	\$0
	Urban	Hectares	\$2,332,729	0	\$0		0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0		0	\$0
	Suburban	Hectares	\$408,227	0	\$0		0	\$0
	Undeveloped	Hectares	\$291,591	41.81856	\$12,193,917		24.347424	\$7,099,491
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	Hectares	\$3,499,093	0	\$0		0	\$0
	Urban	Hectares	\$2,332,729	0	\$0		0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0		0	\$0
	Suburban	Hectares	\$408,227	0	\$0		0	\$0
	Undeveloped	Hectares	\$291,591	0	\$0		0	\$0
Environmental Mitigation								
	Environmental Mitigation	3% of Line Cost				\$1,982,415		\$1,015,722
Signals and Communication								
1	Signaling (ATC)	km	\$720,586	13.720	\$9,886,439		7.988	\$5,756,040
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	13.720	\$8,176,754		7.988	\$4,760,635
3	Wayside Protection System	km	\$57,213	13.720	\$784,968		7.988	\$457,021
Electrification Items								
1	Traction Power Supply	km	\$368,420	13.720	\$5,054,721		7.988	\$2,942,938
2	Traction Power Distribution	km	\$686,995	13.720	\$9,425,567		7.988	\$5,487,714
Vehicle Costs								
1	Fleet size estimate	vehicles	44000000		\$0			\$0
Support Facility Costs								
1	Facility cost breakdown	ea	0		\$0			\$0
Program Implementation Costs								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$20,465,493		\$10,703,019
Contingencies								
	Contingencies	25% of Total Construction Cost				\$20,064,209		\$10,493,156
Total Construction					\$66,080,504			\$33,857,411
Total Construction and Right of Way					\$80,256,836			\$41,972,624
Grand Total					\$120,786,538			\$63,168,799

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Bay Area - Merced**  
**Mountain Crossing**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>Segment 19</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		16.79	
2	Double Track Section - At-Grade	km	\$846,282	16.19	\$13,701,307.34
3	Double Track Section - On Structure	km	\$1,600,459	0.60	\$960,275.55
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.00	\$0.00
5	Double Track Section - In Trench	km	\$1,600,459	0	\$0.00
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0	\$0.00
6	Freight Double Track	km	\$846,282	0	\$0.00
7	Freight Single Track	km	\$423,141	0	\$0.00
9	Four-track construction or reconstruction	km	\$1,692,564	0	\$0.00
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	51.17592	\$526,809.25
2	Total Cut	m3	\$7.59	493471.2	\$3,743,035.77
3	Total Fill	m3	\$7.59	493471.2	\$3,743,035.77
6	Landscape/Erosion Control	Hectares	\$6,881	51.17592	\$352,130.39
7	Security Fencing (Both Sides of R/W)	km	\$86,687	16.19	\$1,403,462.98
8	Special Drainage Facilities	5% of Earthwork Cost			\$488,424
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	0.5	\$5,851,374.38
2	High Structure	km	\$14,043,299	0	\$0.00
3	Long Span Structure	km	\$32,020,021	0	\$0.00
4	Waterway Crossing - Primary	km	\$24,606,000	0.1	\$2,460,600.00
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0.00
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0.00
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0.00
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0.00
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0.00
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0.00
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0.00
11	Crossovers	ea	\$80,782,844	0	\$0.00
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0.00
13	Trench Short	km	\$42,322,835	0	\$0.00
14	Trench Long	km	\$33,464,567	0	\$0.00
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.00	\$0.00
16	Retaining Walls	km	\$3,749,214	0	\$0.00
17	Containment Walls	km	\$1,278,634	0	\$0.00
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0.00
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	29	\$4,399,367
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea			
2	Terminal Passenger Stations	ea			
3	Parking - Structure	space	\$14,244	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0	\$0
3	Single Track Removal	km	\$54,000	0	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	16.790	\$200,128
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0
	Suburban	Hectares	\$408,227	0	\$0
	Undeveloped	Hectares	\$291,591	51.17592	\$14,922,439
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0
	Suburban	Hectares	\$408,227	0	\$0
	Undeveloped	Hectares	\$291,591	0	\$0
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$2,358,480
<b>Signals and Communication</b>					
1	Signalling (ATC)	km	\$720,586	16.790	\$12,098,638
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	16.790	\$10,006,392
3	Wayside Protection System	km	\$57,213	16.790	\$960,614
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	16.790	\$6,185,770
2	Traction Power Distribution	km	\$686,995	16.790	\$11,534,641
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles	44000000		\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea	0		\$0
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$24,453,715
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$23,974,231
<b>Total Construction</b>					<b>\$78,616,003</b>
<b>Total Construction and Right of Way</b>					<b>\$95,896,923</b>
<b>Grand Total</b>					<b>\$144,324,869</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor A: Sacramento to Stockton**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR: SAC DT Depot to STO DT Station (Alignment A1)		CCT: SAC DT Dept to STO DT Station (Alignment A2)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			147.980		150.824	
2	Double Track Section - At-Grade	km	\$846,282		129.605	\$109,682,393	135.284	\$114,488,429
3	Double Track Section - On Structure	km	\$1,600,459		18.375	\$29,408,439	15.540	\$24,871,137
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459		0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459		0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287		0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282		0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141		0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564		0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares	\$10,294		356.063	\$3,665,345	393.334	\$4,049,009
2	Total Cut	m3	\$7.59		890,918.0	\$6,757,715	984,094.0	\$7,464,466
3	Total Fill	m3	\$7.59		890,918.0	\$6,757,715	984,094.0	\$7,464,466
6	Landscape/Erosion Control	Hectares	\$6,881		8.000	\$55,046	6.080	\$41,835
7	Security Fencing (Both Sides of R/W)	km	\$86,687		129.605	\$11,235,072	135.284	\$11,727,368
8	Special Drainage Facilities		5% of Earthwork Cost			\$1,423,545		\$1,537,357
Structures/Tunnels/Walls								
1	Standard Structure	km	\$11,702,749		11.195	\$131,012,272	10.345	\$121,064,936
2	High Structure	km	\$14,043,299		8.150	\$114,452,883	4.650	\$65,301,338
3	Long Span Structure	km	\$32,020,021		0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000		1.530	\$37,647,180	0.480	\$11,810,880
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000		1.940	\$38,218,000	1.905	\$37,528,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150			\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589			\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592			\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733			\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758			\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844			\$0		\$0
11	Crossovers	ea	\$80,782,844			\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379			\$0		\$0
13	Trench Short	km	\$42,322,835		0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		0.000		0.000	
15	Mechanical & Electrical for Tunnels	km	\$1,645,723		0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214		31.160	\$116,825,507	25.860	\$96,954,673
17	Containment Walls	km	\$1,278,634		0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987		0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436		11	\$160,912,795	18	\$263,311,847
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298		36	\$198,946,729	55	\$303,946,391
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886		12	\$11,182,627	10	\$9,318,855
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589		6	\$91,671,532	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374		20	\$117,027,488	7	\$40,959,621
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065		3	\$2,958,195	0	\$0
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702		5	\$758,511	2	\$303,405
Building Items								
1	Intermediate Passenger Stations	ea	N/A		1		1	
	Stockton Intermediate Station	ea	\$10,000,000		1	\$10,000,000	1	\$10,000,000
2	Terminal Passenger Stations	ea	N/A		1		1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000		1	\$224,227,000	1	\$224,227,000
	Power Inn Road Terminal Station	ea	\$224,227,000		0	\$0	0	\$0
3	Parking - Structure	space	\$14,244		2,338	\$33,302,472	2,338	\$33,302,472
4	Parking - At Grade	space	\$2,042		0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km	\$1,083,588		4.400	\$4,767,787	2.400	\$2,600,611
2	Single Track Relocation (Permanent)	km	\$1,083,588		57.807	\$62,638,692	33.119	\$35,887,075
3	Single Track Removal	km	\$54,000		0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511		22.170	\$16,816,200	20.534	\$15,575,275
5	Major Utility Relocations - Urban	km	\$579,719		18.310	\$10,614,664	14.800	\$8,579,849
6	Major Utility Relocations - Dense Suburban	km	\$406,345		16.600	\$6,745,334	32.175	\$13,074,165
7	Major Utility Relocations - Suburban	km	\$232,971		38.775	\$9,033,466	48.975	\$11,409,774
8	Major Utility Relocations - Undeveloped	km	\$11,919		59.780	\$712,546	38.880	\$463,429
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare	\$3,499,093		42.345	\$148,169,798	49.282	\$172,443,987
	Urban	hectare	\$2,332,729		35.794	\$83,497,693	34.350	\$80,129,232
	Dense Suburban	hectare	\$1,166,364		25.232	\$29,429,706	83.980	\$97,951,280
	Suburban	hectare	\$408,227		113.734	\$46,429,341	143.298	\$58,498,177
	Undeveloped	hectare	\$291,591		167.512	\$48,844,881	107.510	\$31,348,835
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	hectare	\$3,499,093		3.209	\$11,229,465	3.209	\$11,229,465
	Urban	hectare	\$2,332,729		1.980	\$4,618,803	1.980	\$4,618,803
	Dense Suburban	hectare	\$1,166,364		0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227		0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591		0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation		3% of Line Cost			\$57,867,848		\$57,601,105
Signals and Communication								
1	Signaling (ATC)	km	\$720,586		147.980	\$106,632,304	150.824	\$108,681,651
2	Communications (w/Fiber Optic Backbone)	km	\$595,973		147.980	\$88,192,131	150.824	\$89,887,079
3	Wayside Protection System	km	\$57,213		147.980	\$8,466,445	150.824	\$8,629,160
Electrification Items								
1	Traction Power Supply	km	\$368,420		147.980	\$54,518,772	150.824	\$55,566,558
2	Traction Power Distribution	km	\$686,995		147.980	\$101,661,475	150.824	\$103,615,288
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Storage Yard & Maintenance Facility							
Program Implementation Costs								
1	Program Implementation Costs		25.5% of Total Cost and Procurement			\$601,549,031		\$620,633,720
Contingencies								
1	Contingencies		25% of Total Construction Cost			\$589,753,952		\$608,464,431
Total Construction						\$1,928,928,276		\$1,920,036,841
Total Construction and Right of Way						\$2,359,015,809		\$2,433,857,725
Grand Total						\$3,550,318,793		\$3,662,955,876

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor A: Sacramento to Stockton**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				UPRR: SAC DT Depot to STO DT Station (Alignment A3)		CCT: SAC DT Depot to STO DT Station (Alignment A4)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		141.500		144.344	
2	Double Track Section - At-Grade	km	\$846,282	122.435	\$103,614,719	128.114	\$108,420,755
3	Double Track Section - On Structure	km	\$1,600,459	19.065	\$30,512,436	16.230	\$25,975,134
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	343.949	\$3,540,636	381.219	\$3,924,301
2	Total Cut	m3	\$7.59	860,631.6	\$6,527,990	953,807.6	\$7,234,740
3	Total Fill	m3	\$7.59	860,631.6	\$6,527,990	953,807.6	\$7,234,740
6	Landscape/Erosion Control	Hectares	\$6,881	6.720	\$46,239	4.800	\$33,028
7	Security Fencing (Both Sides of R/W)		\$86,687	122.435	\$10,613,544	128.114	\$11,105,839
8	Special Drainage Facilities		5% of Earthwork Cost		\$1,362,820		\$1,476,632
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	12.645	\$147,981,258	11.795	\$138,033,922
2	High Structure	km	\$14,043,299	7.250	\$101,813,914	3.750	\$52,662,369
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	1.530	\$37,647,180	0.480	\$11,810,880
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	1.966	\$38,730,200	1.931	\$38,040,700
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	28.000	\$104,977,991	22.700	\$85,107,157
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	11	\$160,912,795	18	\$263,311,847
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	23	\$127,104,855	42	\$232,104,517
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	20	\$18,637,711	18	\$16,773,940
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	6	\$91,671,532	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	15	\$87,770,616	2	\$11,702,749
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	6	\$5,916,390	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	7	\$1,061,916	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Stockton Intermediate Station	ea	\$10,000,000	1	\$10,000,000	1	\$10,000,000
2	Terminal Passenger Stations	ea	N/A	1		1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000	1	\$224,227,000	1	\$224,227,000
	Power Inn Road Terminal Station	ea	\$224,227,000	0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	2,338	\$33,302,472	2,338	\$33,302,472
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	2.800	\$3,034,046	0.800	\$866,870
2	Single Track Relocation (Permanent)	km	\$1,083,588	52.557	\$56,949,856	27.869	\$30,198,239
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	22.170	\$16,816,200	20.534	\$15,575,275
5	Major Utility Relocations - Urban	km	\$579,719	18.310	\$10,614,664	14.800	\$8,579,849
6	Major Utility Relocations - Dense Suburban	km	\$406,345	11.500	\$4,672,973	27.075	\$11,001,803
7	Major Utility Relocations - Suburban	km	\$232,971	26.700	\$6,220,336	36.900	\$8,596,644
8	Major Utility Relocations - Undeveloped	km	\$11,919	70.476	\$840,036	49.576	\$590,919
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	42.345	\$148,169,798	49.282	\$172,443,987
	Urban	hectare	\$2,332,729	35.794	\$83,497,693	34.350	\$80,129,232
	Dense Suburban	hectare	\$1,166,364	17.480	\$20,388,049	76.228	\$88,909,623
	Suburban	hectare	\$408,227	71.022	\$28,993,130	100.586	\$41,061,966
	Undeveloped	hectare	\$291,591	206.685	\$60,267,505	146.683	\$42,771,459
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	3.209	\$11,229,465	3.209	\$11,229,465
	Urban	hectare	\$2,332,729	1.980	\$4,618,803	1.980	\$4,618,803
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$53,921,409		\$53,654,666
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	141.500	\$101,962,907	144.344	\$104,012,254
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	141.500	\$84,330,224	144.344	\$86,025,172
3	Wayside Protection System	km	\$57,213	141.500	\$8,095,702	144.344	\$8,258,417
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	141.500	\$52,131,411	144.344	\$53,179,197
2	Traction Power Distribution	km	\$686,995	141.500	\$97,209,749	144.344	\$99,163,562
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Storage Yard & Maintenance Facility						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$563,158,870		\$582,243,559
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$552,116,539		\$570,827,018
<b>Total Construction</b>					<b>\$1,797,380,306</b>		<b>\$1,788,488,871</b>
<b>Total Construction and Right of Way</b>					<b>\$2,208,466,157</b>		<b>\$2,283,308,073</b>
<b>Grand Total</b>					<b>\$3,323,741,567</b>		<b>\$3,436,378,650</b>



**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor A: Sacramento to Stockton**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				UPRR: Power Inn Rd. Station to STO DT Station (Alignment A5)		CCT: Power Inn Rd. Station to STO DT Station (Alignment A6)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		135.920		139.740	
2	Double Track Section - At-Grade	km	\$846,282	123.585	\$104,587,774	129.795	\$109,843,186
3	Double Track Section - On Structure	km	\$1,600,459	12.335	\$19,741,665	9.945	\$15,916,567
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	342.611	\$3,526,869	385.655	\$3,969,961
2	Total Cut	m3	\$7.59	857,288.0	\$6,502,628	964,896.5	\$7,318,851
3	Total Fill	m3	\$7.59	857,288.0	\$6,502,628	964,896.5	\$7,318,851
6	Landscape/Erosion Control	Hectares	\$6,881	7.040	\$48,441	5.760	\$39,633
7	Security Fencing (Both Sides of R/W)		\$86,687	123.585	\$10,713,216	129.795	\$11,251,543
8	Special Drainage Facilities		5% of Earthwork Cost		\$1,364,689		\$1,494,942
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	8.075	\$94,499,696	6.725	\$78,700,985
2	High Structure	km	\$14,043,299	0.900	\$12,638,969	0.900	\$12,638,969
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	1.530	\$37,647,180	0.480	\$11,810,880
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	1.850	\$36,445,000	1.930	\$38,021,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000		0.000	
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	24.360	\$91,330,852	19.560	\$73,334,625
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	7	\$102,399,052	10	\$146,284,359
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	36	\$198,946,729	55	\$303,946,391
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	12	\$11,182,627	10	\$9,318,855
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	4	\$61,114,355	3	\$45,835,766
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	20	\$117,027,488	7	\$40,959,621
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	2	\$303,405
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Stockton Intermediate Station	ea	\$10,000,000	1	\$10,000,000	1	\$10,000,000
2	Terminal Passenger Stations	ea	N/A	1		1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000	0	\$0	0	\$0
	Power Inn Road Terminal Station	ea	\$224,227,000	1	\$224,227,000	1	\$224,227,000
3	Parking - Structure	space	\$14,244	2,338	\$33,302,472	2,338	\$33,302,472
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	4.400	\$4,767,787	2.400	\$2,600,611
2	Single Track Relocation (Permanent)	km	\$1,083,588	52.219	\$56,583,603	40.219	\$43,580,549
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	9.400	\$7,130,008	7.400	\$5,612,985
5	Major Utility Relocations - Urban	km	\$579,719	11.360	\$6,585,614	14.800	\$8,579,849
6	Major Utility Relocations - Dense Suburban	km	\$406,345	16.600	\$6,745,334	32.175	\$13,074,165
7	Major Utility Relocations - Suburban	km	\$232,971	38.775	\$9,033,466	48.975	\$11,409,774
8	Major Utility Relocations - Undeveloped	km	\$11,919	59.780	\$712,546	38.880	\$463,429
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	25.550	\$89,401,829	22.510	\$78,764,586
	Urban	hectare	\$2,332,729	31.394	\$73,232,753	39.515	\$92,177,776
	Dense Suburban	hectare	\$1,166,364	25.232	\$29,429,706	83.980	\$97,951,280
	Suburban	hectare	\$408,227	113.734	\$46,429,341	143.298	\$58,498,177
	Undeveloped	hectare	\$291,591	167.512	\$48,844,881	107.510	\$31,348,835
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	1.811	\$6,336,858	1.811	\$6,337,732
	Urban	hectare	\$2,332,729	1.980	\$4,618,803	1.980	\$4,618,803
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$48,271,435		\$48,318,415
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	135.920	\$97,942,038	139.740	\$100,694,676
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	135.920	\$81,004,693	139.740	\$83,281,311
3	Wayside Protection System	km	\$57,213	135.920	\$7,776,451	139.740	\$7,995,006
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	135.920	\$50,075,628	139.740	\$51,482,992
2	Traction Power Distribution	km	\$686,995	135.920	\$93,376,319	139.740	\$96,000,639
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Storage Yard & Maintenance Facility						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$498,681,423		\$517,300,511
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$488,903,356		\$507,157,363
<b>Total Construction</b>					<b>\$1,609,047,818</b>		<b>\$1,610,613,848</b>
<b>Total Construction and Right of Way</b>					<b>\$1,955,613,422</b>		<b>\$2,028,629,453</b>
<b>Grand Total</b>					<b>\$2,943,198,201</b>		<b>\$3,053,087,327</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor A: Sacramento to Stockton**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				UPRR: Power Inn Rd. Station to STO DT Station (Alignment A7)		CCT: Power Inn Rd. Station to STO DT Station (Alignment A8)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		129.440		133.260	
2	Double Track Section - At-Grade	km	\$846,282	116.415	\$98,520,101	122.625	\$103,775,513
3	Double Track Section - On Structure	km	\$1,600,459	13.025	\$20,845,662	10.635	\$17,020,564
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	330.497	\$3,402,160	373.540	\$3,845,253
2	Total Cut	m3	\$7.59	827,001.6	\$6,272,902	934,610.1	\$7,089,125
3	Total Fill	m3	\$7.59	827,001.6	\$6,272,902	934,610.1	\$7,089,125
6	Landscape/Erosion Control	Hectares	\$6,881	5.760	\$39,633	4.480	\$30,826
7	Security Fencing (Both Sides of R/W)		\$86,687	116.415	\$10,091,688	122.625	\$10,630,014
8	Special Drainage Facilities		5% of Earthwork Cost		\$1,303,964		\$1,434,217
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	9.525	\$111,468,682	8.175	\$95,669,971
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	1.530	\$37,647,180	0.480	\$11,810,880
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	1.876	\$36,957,200	1.956	\$38,533,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	21.200	\$79,483,336	16.400	\$61,487,109
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	7	\$102,399,052	10	\$146,284,359
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	23	\$127,104,855	42	\$232,104,517
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	20	\$18,637,711	18	\$16,773,940
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	4	\$61,114,355	3	\$45,835,766
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	15	\$87,770,616	2	\$11,702,749
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	6	\$5,916,390	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	6	\$910,214	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Stockton Intermediate Station	ea	\$10,000,000	1	\$10,000,000	1	\$10,000,000
2	Terminal Passenger Stations	ea	N/A	1		1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000	0	\$0	0	\$0
	Power Inn Road Terminal Station	ea	\$224,227,000	1	\$224,227,000	1	\$224,227,000
3	Parking - Structure	space	\$14,244	2,338	\$33,302,472	2,338	\$33,302,472
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	2.800	\$3,034,046	0.800	\$866,870
2	Single Track Relocation (Permanent)	km	\$1,083,588	46.969	\$50,894,767	34.969	\$37,891,713
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	9.400	\$7,130,008	7.400	\$5,612,985
5	Major Utility Relocations - Urban	km	\$579,719	11.360	\$6,585,614	14.800	\$8,579,849
6	Major Utility Relocations - Dense Suburban	km	\$406,345	11.500	\$4,672,973	27.075	\$11,001,803
7	Major Utility Relocations - Suburban	km	\$232,971	26.700	\$6,220,336	36.900	\$8,596,644
8	Major Utility Relocations - Undeveloped	km	\$11,919	70.476	\$840,036	49.576	\$590,919
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	25.550	\$89,401,829	22.510	\$78,764,586
	Urban	hectare	\$2,332,729	31.394	\$73,232,753	39.515	\$92,177,776
	Dense Suburban	hectare	\$1,166,364	17.480	\$20,388,049	76.228	\$88,909,623
	Suburban	hectare	\$408,227	71.022	\$28,993,130	100.586	\$41,061,966
	Undeveloped	hectare	\$291,591	206.685	\$60,267,505	146.683	\$42,771,459
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	1.811	\$6,336,858	1.811	\$6,337,732
	Urban	hectare	\$2,332,729	1.980	\$4,618,803	1.980	\$4,618,803
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$44,324,995		\$44,371,976
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	129.440	\$93,272,641	133.260	\$96,025,280
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	129.440	\$77,142,786	133.260	\$79,419,404
3	Wayside Protection System	km	\$57,213	129.440	\$7,405,707	133.260	\$7,624,263
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	129.440	\$47,688,268	133.260	\$49,095,632
2	Traction Power Distribution	km	\$686,995	129.440	\$88,924,593	133.260	\$91,548,913
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Storage Yard & Maintenance Facility						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$460,291,261		\$478,910,349
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$451,265,943		\$469,519,950
<b>Total Construction</b>					<b>\$1,477,499,848</b>		<b>\$1,479,065,878</b>
<b>Total Construction and Right of Way</b>					<b>\$1,805,063,770</b>		<b>\$1,878,079,801</b>
<b>Grand Total</b>					<b>\$2,716,620,974</b>		<b>\$2,826,510,101</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor A: Sacramento to Stockton**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>UPRR: SAC DT Depot to STO DT Station (Alignment A1 NO LEAD TRACKS) No Stockton loop or Station</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		101.980	
2	Double Track Section - At-Grade	km	\$846,282	89.735	\$75,941,125
3	Double Track Section - On Structure	km	\$1,600,459	12.245	\$19,597,624
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	235.760	\$2,426,929
2	Total Cut	m3	\$7.59	589,399.0	\$4,470,659
3	Total Fill	m3	\$7.59	589,399.0	\$4,470,659
6	Landscape/Erosion Control	Hectares	\$6,881	4.480	\$30,826
7	Security Fencing (Both Sides of R/W)	km	\$86,687	89.735	\$7,778,860
8	Special Drainage Facilities	5% of Earthwork Cost			\$958,897
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	5.295	\$61,966,055
2	High Structure	km	\$14,043,299	5.500	\$77,238,142
3	Long Span Structure	km	\$32,020,021	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	1.505	\$37,032,030
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	1.695	\$33,391,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	21.610	\$81,020,514
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	5	\$73,142,180
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	23	\$127,104,855
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	10	\$9,318,855
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	2	\$30,557,177
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	13	\$76,067,867
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	3	\$455,107
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea	N/A	0	
	Stockton Intermediate Station	ea	\$10,000,000	0	\$0
2	Terminal Passenger Stations	ea	N/A	1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000	1	\$224,227,000
	Power Inn Road Terminal Station	ea	\$224,227,000	0	\$0
3	Parking - Structure	space	\$14,244	1,811	\$25,795,884
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	1.600	\$1,733,741
2	Single Track Relocation (Permanent)	km	\$1,083,588	32.682	\$35,413,547
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	10.720	\$8,131,243
5	Major Utility Relocations - Urban	km	\$579,719	8.950	\$5,188,490
6	Major Utility Relocations - Dense Suburban	km	\$406,345	11.500	\$4,672,973
7	Major Utility Relocations - Suburban	km	\$232,971	23.025	\$5,364,166
8	Major Utility Relocations - Undeveloped	km	\$11,919	49.330	\$587,987
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	hectare	\$3,499,093	19.835	\$69,405,212
	Urban	hectare	\$2,332,729	13.604	\$31,734,442
	Dense Suburban	hectare	\$1,166,364	17.480	\$20,388,049
	Suburban	hectare	\$408,227	67.222	\$27,441,865
	Undeveloped	hectare	\$291,591	136.048	\$39,670,260
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	hectare	\$3,499,093	3.209	\$11,229,465
	Urban	hectare	\$2,332,729	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0
<b>Environmental Impact Mitigation</b>					
1	Environmental Mitigation	3% of Line Cost			\$38,543,148
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	101.980	\$73,485,352
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	101.980	\$60,777,359
3	Wayside Protection System	km	\$57,213	101.980	\$5,834,626
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	101.980	\$37,571,458
2	Traction Power Distribution	km	\$686,995	101.980	\$70,059,719
<b>Vehicle Costs</b>					
1	Fleet Size Estimate				\$0
<b>Support Facility Costs</b>					
1	Storage Yard & Maintenance Facility				
<b>Program Implementation Costs</b>					
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$388,411,930
<b>Contingencies</b>					
1	Contingencies	25% of Total Construction Cost			\$380,796,010
<b>Total Construction</b>					<b>\$1,284,771,600</b>
<b>Total Construction and Right of Way</b>					<b>\$1,523,184,041</b>
<b>Grand Total</b>					<b>\$2,292,391,982</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor A: Sacramento to Stockton**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>UPRR: SAC DT Depot to STO DT Station (Alignment A1 NO LEAD TRACKS)</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		147.980	
2	Double Track Section - At-Grade	km	\$846,282	129.605	\$109,682,393
3	Double Track Section - On Structure	km	\$1,600,459	18.375	\$29,408,439
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	349.976	\$3,602,678
2	Total Cut	m3	\$7.59	875,699.0	\$6,642,278
3	Total Fill	m3	\$7.59	875,699.0	\$6,642,278
6	Landscape/Erosion Control	Hectares	\$6,881	7.040	\$48,441
7	Security Fencing (Both Sides of R/W)	km	\$86,687	129.605	\$11,235,072
8	Special Drainage Facilities	5% of Earthwork Cost			\$1,408,537
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	10.345	\$121,064,936
2	High Structure	km	\$14,043,299	6.400	\$89,877,110
3	Long Span Structure	km	\$32,020,021	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	1.530	\$37,647,180
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	1.870	\$36,839,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	27.010	\$101,266,269
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	10	\$146,284,359
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	36	\$198,946,729
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	12	\$11,182,627
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	20	\$117,027,488
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	5	\$758,511
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea	N/A	1	
	Stockton Intermediate Station	ea	\$10,000,000	1	\$10,000,000
2	Terminal Passenger Stations	ea	N/A	1	
	Sacramento Downtown Terminal Station	ea	\$224,227,000	1	\$224,227,000
	Power Inn Road Terminal Station	ea	\$224,227,000	0	\$0
3	Parking - Structure	space	\$14,244	2,338	\$33,302,472
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	4.000	\$4,334,351
2	Single Track Relocation (Permanent)	km	\$1,083,588	57.307	\$62,096,898
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	18.120	\$13,744,228
5	Major Utility Relocations - Urban	km	\$579,719	16.250	\$9,420,442
6	Major Utility Relocations - Dense Suburban	km	\$406,345	16.600	\$6,745,334
7	Major Utility Relocations - Suburban	km	\$232,971	38.775	\$9,033,466
8	Major Utility Relocations - Undeveloped	km	\$11,919	59.780	\$712,546
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	hectare	\$3,499,093	42.345	\$148,169,798
	Urban	hectare	\$2,332,729	35.794	\$83,497,693
	Dense Suburban	hectare	\$1,166,364	25.232	\$29,429,706
	Suburban	hectare	\$408,227	113.734	\$46,429,341
	Undeveloped	hectare	\$291,591	167.512	\$48,844,881
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	hectare	\$3,499,093	3.209	\$11,229,465
	Urban	hectare	\$2,332,729	1.980	\$4,618,803
	Dense Suburban	hectare	\$1,166,364	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0
<b>Environmental Impact Mitigation</b>					
1	Environmental Mitigation	3% of Line Cost			\$55,260,100
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	147.980	\$106,632,304
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	147.980	\$88,192,131
3	Wayside Protection System	km	\$57,213	147.980	\$8,466,445
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	147.980	\$54,518,772
2	Traction Power Distribution	km	\$686,995	147.980	\$101,661,475
<b>Vehicle Costs</b>					
1	Fleet Size Estimate				\$0
<b>Support Facility Costs</b>					
1	Storage Yard & Maintenance Facility				
<b>Program Implementation Costs</b>					
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$578,718,194
<b>Contingencies</b>					
1	Contingencies	25% of Total Construction Cost			\$567,370,778
<b>Total Construction</b>					<b>\$1,842,003,327</b>
<b>Total Construction and Right of Way</b>					<b>\$2,269,483,112</b>
<b>Grand Total</b>					<b>\$3,415,572,083</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor B: Stockton to Modesto**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				"Express Loop"/UPRR: to Modesto B1 Station (Alignment B1)		"Express Loop"/BNSF: to Modesto Briggsmore Station (Alignment B2)	
Alignment Cost				Quantities	Item Cost	Quantities	Item Cost
<b>Track</b>							
1	Double Track Section - Total	km		54.570		27.750	
2	Double Track Section - At-Grade	km	\$846,282	49.941	\$42,264,175	23.487	\$19,876,628
3	Double Track Section - On Structure	km	\$1,600,459	4.629	\$7,408,526	4.263	\$6,822,758
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	150.366	\$1,547,880	70.148	\$722,109
2	Total Cut	m3	\$7.59	375,915.0	\$2,851,358	175,370.0	\$1,330,202
3	Total Fill	m3	\$7.59	375,915.0	\$2,851,358	175,370.0	\$1,330,202
6	Landscape/Erosion Control	Hectares	\$6,881	1.600	\$11,009	1.280	\$8,807
7	Security Fencing (Both Sides of R/W)	km	\$86,687	49.941	\$4,329,237	23.487	\$2,036,018
8	Special Drainage Facilities		5% of Earthwork Cost		\$579,542		\$271,367
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	4.169	\$48,788,760	3.550	\$41,544,758
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.460	\$11,318,760	0.150	\$3,690,900
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.400	\$7,880,000	0.380	\$7,486,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	6.550	\$24,557,351	4.500	\$16,871,463
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	9	\$131,655,923	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	38	\$209,999,325	10	\$55,262,980
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	1	\$931,886	8	\$7,455,084
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	5	\$29,256,872
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	1	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Modesto Downtown Intermediate Station	ea	\$165,048,000	1	\$165,048,000	0	\$0
	Amtrak Briggsmore Intermediate Station	ea	\$32,430,000	0	\$0	1	\$32,430,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	473	\$6,737,412	539	\$7,677,516
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	1.600	\$1,733,741
2	Single Track Relocation (Permanent)	km	\$1,083,588	25.338	\$27,455,949	4.438	\$4,808,421
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	15.750	\$9,130,582	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	5.600	\$2,275,534
7	Major Utility Relocations - Suburban	km	\$232,971	36.744	\$8,560,301	14.300	\$3,331,491
8	Major Utility Relocations - Undeveloped	km	\$11,919	2.075	\$24,733	7.850	\$93,568
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment				\$0		\$0
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	47.880	\$55,845,526	10.640	\$12,410,117
	Suburban	hectare	\$408,227	0.000	\$0	41.040	\$16,753,654
	Undeveloped	hectare	\$291,591	113.003	\$32,950,627	23.864	\$6,958,528
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	1.930	\$4,502,166	2.267	\$5,288,296
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$25,394,784		\$9,416,342
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	54.570	\$39,322,374	27.750	\$19,996,259
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	54.570	\$32,522,264	27.750	\$16,538,260
3	Wayside Protection System	km	\$57,213	54.570	\$3,122,137	27.750	\$1,587,673
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	54.570	\$20,104,672	27.750	\$10,223,651
2	Traction Power Distribution	km	\$686,995	54.570	\$37,489,301	27.750	\$19,064,103
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$246,122,409		\$92,999,776
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$241,296,480		\$91,176,251
<b>Total Construction</b>					<b>\$846,492,815</b>		<b>\$313,878,067</b>
<b>Total Construction and Right of Way</b>					<b>\$965,185,919</b>		<b>\$364,705,005</b>
<b>Grand Total</b>					<b>\$1,452,604,808</b>		<b>\$548,881,033</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor B: Stockton to Modesto**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>"Express Loop"/UPRR: to Modesto B1 Station (Alignment B1) NO LOOP</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		30.400	
2	Double Track Section - At-Grade	km	\$846,282	26.890	\$22,756,526
3	Double Track Section - On Structure	km	\$1,600,459	3.510	\$5,617,612
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	82.840	\$852,762
2	Total Cut	m3	\$7.59	207,100.0	\$1,570,877
3	Total Fill	m3	\$7.59	207,100.0	\$1,570,877
6	Landscape/Erosion Control	Hectares	\$6.881	0.640	\$4,404
7	Security Fencing (Both Sides of R/W)	km	\$86,687	26.890	\$2,331,014
8	Special Drainage Facilities	5% of Earthwork Cost			\$316,497
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	3.150	\$36,863,659
2	High Structure	km	\$14,043,299	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.360	\$8,858,160
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		\$19,700,000	0.170	\$3,349,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	2.800	\$10,497,799
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	9	\$131,655,923
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	12	\$66,315,576
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea	N/A	1	
	Modesto Downtown Intermediate Station	ea	\$165,048,000	1	\$165,048,000
	Amtrack Briggsmore Intermediate Station	ea	\$32,430,000	0	\$0
2	Terminal Passenger Stations	ea	N/A	0	
3	Parking - Structure	space	\$14,244	473	\$6,737,412
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	25.338	\$27,455,949
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	15.750	\$9,130,582
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	14.650	\$3,413,031
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				\$0
	Dense Urban	hectare	\$3,499,093	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	47.880	\$55,845,526
	Suburban	hectare	\$408,227	0.000	\$0
	Undeveloped	hectare	\$291,591	43.928	\$12,809,011
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	hectare	\$3,499,093	0.000	\$0
	Urban	hectare	\$2,332,729	1.930	\$4,502,166
	Dense Suburban	hectare	\$1,166,364	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0
<b>Environmental Impact Mitigation</b>					
1	Environmental Mitigation	3% of Line Cost			\$17,345,789
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	30.400	\$21,905,812
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	30.400	\$18,117,589
3	Wayside Protection System	km	\$57,213	30.400	\$1,739,289
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	30.400	\$11,199,964
2	Traction Power Distribution	km	\$686,995	30.400	\$20,884,639
<b>Vehicle Costs</b>					
1	Fleet Size Estimate				\$0
<b>Support Facility Costs</b>					
1	Facility Cost Breakdown				
<b>Program Implementation Costs</b>					
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$170,517,338
<b>Contingencies</b>					
1	Contingencies	25% of Total Construction Cost			\$167,173,861
<b>Total Construction</b>					<b>\$578,192,952</b>
<b>Total Construction and Right of Way</b>					<b>\$668,695,444</b>
<b>Grand Total</b>					<b>\$1,006,386,644</b>



**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				UPRR: to Merced DT Station (Alignment C1)		UPRR: to Merced DT Station (Alignment C2)	
Alignment Cost							
Track				Item	Item Cost	Item	Item Cost
1	Double Track Section - Total	km		59.600		80.146	
2	Double Track Section - At-Grade	km	\$846,282	48.484	\$41,031,142	68.655	\$58,101,498
3	Double Track Section - On Structure	km	\$1,600,459	11.116	\$17,790,705	11.491	\$18,390,877
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	131.936	\$1,358,160	186.785	\$1,922,783
2	Total Cut	m3	\$7.59	329,840.0	\$2,501,874	466,989.6	\$3,542,170
3	Total Fill	m3	\$7.59	329,840.0	\$2,501,874	466,989.6	\$3,542,170
6	Landscape/Erosion Control	Hectares	\$6,881	1.280	\$8,807	1.280	\$8,807
7	Security Fencing (Both Sides of R/W)	km	\$86,687	48.484	\$4,202,934	68.655	\$5,951,498
8	Special Drainage Facilities	5% of Earthwork Cost			\$528,683		\$748,371
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	6.650	\$77,823,279	6.650	\$77,823,279
2	High Structure	km	\$14,043,299	4.200	\$58,981,854	4.200	\$58,981,854
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.521	\$10,263,700	1.031	\$20,310,700
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	3.700	\$13,872,092	3.700	\$13,872,092
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	2	\$29,256,872	2	\$29,256,872
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	23	\$127,104,855	27	\$149,210,047
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	1	\$931,886	15	\$13,978,283
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	9	\$137,507,298	9	\$137,507,298
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	7	\$40,959,621	7	\$40,959,621
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
Building Items							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	144	\$2,051,136	144	\$2,051,136
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	6.400	\$6,934,962	6.400	\$6,934,962
2	Single Track Relocation (Permanent)	km	\$1,083,588	8.313	\$9,007,866	8.313	\$9,007,866
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	1.950	\$1,479,097	1.950	\$1,479,097
5	Major Utility Relocations - Urban	km	\$579,719	2.550	\$1,478,285	2.550	\$1,478,285
6	Major Utility Relocations - Dense Suburban	km	\$406,345	8.050	\$3,271,081	8.050	\$3,271,081
7	Major Utility Relocations - Suburban	km	\$232,971	39.600	\$9,225,667	44.100	\$10,274,038
8	Major Utility Relocations - Undeveloped	km	\$11,919	7.450	\$88,800	23.496	\$280,060
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	5.928	\$13,828,416	2.964	\$6,914,208
	Dense Suburban	hectare	\$1,166,364	19.988	\$23,313,291	16.112	\$18,792,463
	Suburban	hectare	\$408,227	99.864	\$40,767,226	112.784	\$46,041,524
	Undeveloped	hectare	\$291,591	22.648	\$6,603,954	71.428	\$20,827,718
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.700	\$1,632,910	0.700	\$1,632,910
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation							
1	Environmental Mitigation	3% of Line Cost			\$23,428,113		\$26,987,082
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	59.600	\$42,946,921	80.146	\$57,752,079
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	59.600	\$35,520,010	80.146	\$47,764,877
3	Wayside Protection System	km	\$57,213	59.600	\$3,409,921	80.146	\$4,585,428
Electrification Items							
1	Traction Power Supply	km	\$368,420	59.600	\$21,957,824	80.146	\$29,527,379
2	Traction Power Distribution	km	\$686,995	59.600	\$40,944,884	80.146	\$55,059,877
Vehicle Costs							
1	Fleet Size Estimate				\$0		\$0
Support Facility Costs							
1	Facility Cost Breakdown						
Program Implementation Costs							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$227,080,305		\$260,295,150
Contingencies							
1	Contingencies	25% of Total Construction Cost			\$222,627,750		\$255,191,323
Total Construction					\$780,937,092		\$899,569,389
Total Construction and Right of Way					\$890,511,001		\$1,020,765,294
Grand Total					\$1,340,219,057		\$1,536,251,767

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
<b>Alignment Cost</b>				<b>UPRR: to Merced DT Station (Alignment C3)</b>		<b>UPRR: to Merced DT Station (Alignment C4)</b>	
<b>Track</b>				<b>Item</b>	<b>Item Cost</b>	<b>Item</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		59.614		80.655	
2	Double Track Section - At-Grade	km	\$846,282	48.564	\$41,098,844	69.105	\$58,482,325
3	Double Track Section - On Structure	km	\$1,600,459	11.050	\$17,685,075	11.550	\$18,485,304
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	131.979	\$1,358,598	185.185	\$1,906,307
2	Total Cut	m3	\$7.59	329,946.4	\$2,502,681	462,988.2	\$3,511,819
3	Total Fill	m3	\$7.59	329,946.4	\$2,502,681	462,988.2	\$3,511,819
6	Landscape/Erosion Control	Hectares	\$6,887	1.280	\$8,807	1.920	\$13,211
7	Security Fencing (Both Sides of R/W)	km	\$86,687	48.564	\$4,209,869	69.105	\$5,990,507
8	Special Drainage Facilities		5% of Earthwork Cost		\$529,132		\$746,683
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	6.650	\$77,823,279	6.900	\$80,748,966
2	High Structure	km	\$14,043,299	4.200	\$58,981,854	4.200	\$58,981,854
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.430	\$8,471,000	0.815	\$16,055,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	3.700	\$13,872,092	6.850	\$25,682,116
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	2	\$29,256,872	2	\$29,256,872
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	24	\$132,631,153	27	\$149,210,047
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	1	\$931,886	13	\$12,114,512
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	9	\$137,507,298	9	\$137,507,298
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	7	\$40,959,621	7	\$40,959,621
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	2	\$1,972,130
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	144	\$2,051,136	144	\$2,051,136
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	6.000	\$6,501,527	6.000	\$6,501,527
2	Single Track Relocation (Permanent)	km	\$1,083,588	8.313	\$9,007,866	8.313	\$9,007,866
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	1.950	\$1,479,097	1.950	\$1,479,097
5	Major Utility Relocations - Urban	km	\$579,719	2.550	\$1,478,285	2.550	\$1,478,285
6	Major Utility Relocations - Dense Suburban	km	\$406,345	8.050	\$3,271,081	8.050	\$3,271,081
7	Major Utility Relocations - Suburban	km	\$232,971	41.114	\$9,578,386	45.614	\$10,626,757
8	Major Utility Relocations - Undeveloped	km	\$11,919	5.950	\$70,921	22.493	\$268,105
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	5.928	\$20,742,624	2.964	\$10,371,312
	Urban	hectare	\$2,332,729	7.752	\$18,083,313	3.876	\$9,041,657
	Dense Suburban	hectare	\$1,166,364	12.236	\$14,271,634	12.236	\$14,271,634
	Suburban	hectare	\$408,227	104.467	\$42,646,117	117.387	\$47,920,416
	Undeveloped	hectare	\$291,591	18.088	\$5,274,299	65.605	\$19,129,748
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.700	\$1,632,910	0.700	\$1,632,910
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$23,507,746		\$27,263,509
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	59.614	\$42,957,009	80.655	\$58,118,857
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	59.614	\$35,528,353	80.655	\$48,068,228
3	Wayside Protection System	km	\$57,213	59.614	\$3,410,722	80.655	\$4,614,550
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	59.614	\$21,962,982	80.655	\$29,714,904
2	Traction Power Distribution	km	\$686,995	59.614	\$40,954,502	80.655	\$55,409,557
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$231,986,299		\$264,795,783
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$227,437,548		\$259,603,709
<b>Total Construction</b>					<b>\$783,591,547</b>		<b>\$908,783,649</b>
<b>Total Construction and Right of Way</b>					<b>\$909,750,191</b>		<b>\$1,038,414,836</b>
<b>Grand Total</b>					<b>\$1,369,174,037</b>		<b>\$1,562,814,328</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Merced DT Station (Alignment C5)		BNSF: to Merced DT Station (Alignment C6)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Item</b>	<b>Item Cost</b>	<b>Item</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		65.236		84.739	
2	Double Track Section - At-Grade	km	\$846,282	61.246	\$51,831,563	80.314	\$67,968,640
3	Double Track Section - On Structure	km	\$1,600,459	3.990	\$6,385,192	4.425	\$7,081,392
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	188.969	\$1,945,267	236.776	\$2,437,397
2	Total Cut	m3	\$7.59	472,423.6	\$3,583,387	591,941.2	\$4,489,942
3	Total Fill	m3	\$7.59	472,423.6	\$3,583,387	591,941.2	\$4,489,942
6	Landscape/Erosion Control	Hectares	\$6,881	0.320	\$2,202	0.960	\$6,606
7	Security Fencing (Both Sides of R/W)	km	\$86,687	61.246	\$5,309,251	80.314	\$6,962,217
8	Special Drainage Facilities		5% of Earthwork Cost		\$721,175		\$919,305
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	2.400	\$28,086,597	2.600	\$30,427,147
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.250	\$6,151,500	0.250	\$6,151,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.596	\$11,741,200	0.901	\$17,749,700
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	1.600	\$5,998,742	4.800	\$17,996,227
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	3	\$43,885,308	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	25	\$138,157,451	32	\$176,841,537
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	13	\$12,114,512	20	\$18,637,711
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	8	\$122,228,709	8	\$122,228,709
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	11	\$64,365,118	11	\$64,365,118
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	3	\$2,958,195	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	144	\$2,051,136	144	\$2,051,136
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	8.400	\$9,102,138	8.400	\$9,102,138
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.250	\$1,354,485	1.250	\$1,354,485
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	7.000	\$4,058,036	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345	3.700	\$1,503,478	3.700	\$1,503,478
7	Major Utility Relocations - Suburban	km	\$232,971	29.736	\$6,927,637	38.736	\$9,024,380
8	Major Utility Relocations - Undeveloped	km	\$11,919	24.800	\$295,603	35.301	\$420,769
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	20.596	\$48,044,881	12.160	\$28,365,982
	Dense Suburban	hectare	\$1,166,364	11.248	\$13,119,266	11.248	\$13,119,266
	Suburban	hectare	\$408,227	85.381	\$34,855,047	110.005	\$44,907,240
	Undeveloped	hectare	\$291,591	73.264	\$21,363,126	105.187	\$30,671,598
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.745	\$1,736,717	0.700	\$1,632,910
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$21,775,442		\$25,859,842
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	65.236	\$47,007,999	84.739	\$61,061,730
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	65.236	\$38,878,796	84.739	\$50,502,183
3	Wayside Protection System	km	\$57,213	65.236	\$3,732,364	84.739	\$4,848,210
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	65.236	\$24,034,165	84.739	\$31,219,531
2	Traction Power Distribution	km	\$686,995	65.236	\$44,816,649	84.739	\$58,215,243
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$221,019,345		\$256,670,647
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$216,685,633		\$251,637,889
<b>Total Construction</b>					<b>\$725,848,052</b>		<b>\$861,994,720</b>
<b>Total Construction and Right of Way</b>					<b>\$866,742,531</b>		<b>\$1,006,551,558</b>
<b>Grand Total</b>					<b>\$1,304,447,509</b>		<b>\$1,514,860,095</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Merced DT Station (Alignment C7)		BNSF: to Merced DT Station (Alignment C8)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Item</b>	<b>Item Cost</b>	<b>Item</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		65.250		85.248	
2	Double Track Section - At-Grade	km	\$846,282	61.326	\$51,899,266	80.764	\$68,349,467
3	Double Track Section - On Structure	km	\$1,600,459	3.924	\$6,279,562	4.484	\$7,175,819
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	189.012	\$1,945,706	235.176	\$2,420,921
2	Total Cut	m3	\$7.59	472,530.0	\$3,584,194	587,939.8	\$4,459,591
3	Total Fill	m3	\$7.59	472,530.0	\$3,584,194	587,939.8	\$4,459,591
6	Landscape/Erosion Control	Hectares	\$6,881	0.320	\$2,202	1.600	\$11,009
7	Security Fencing (Both Sides of R/W)	km	\$86,687	61.326	\$5,316,186	80.764	\$7,001,226
8	Special Drainage Facilities		5% of Earthwork Cost		\$721,624		\$917,617
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	2.400	\$28,086,597	2.850	\$33,352,834
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.250	\$6,151,500	0.250	\$6,151,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.505	\$9,948,500	0.685	\$13,494,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	1.600	\$5,998,742	7.950	\$29,806,251
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	3	\$43,885,308	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	26	\$143,683,749	32	\$176,841,537
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	13	\$12,114,512	18	\$16,773,940
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	8	\$122,228,709	8	\$122,228,709
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	11	\$64,365,118	11	\$64,365,118
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	2	\$1,972,130
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	144	\$2,051,136	144	\$2,051,136
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	8.000	\$8,668,703	8.000	\$8,668,703
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.250	\$1,354,485	1.250	\$1,354,485
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	7.000	\$4,058,036	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345	3.700	\$1,503,478	3.700	\$1,503,478
7	Major Utility Relocations - Suburban	km	\$232,971	31.250	\$7,280,356	40.250	\$9,377,098
8	Major Utility Relocations - Undeveloped	km	\$11,919	23.300	\$277,724	34.298	\$408,814
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	20.596	\$48,044,881	12.160	\$28,365,982
	Dense Suburban	hectare	\$1,166,364	11.248	\$13,119,266	11.248	\$13,119,266
	Suburban	hectare	\$408,227	89.984	\$36,733,939	114.608	\$46,786,131
	Undeveloped	hectare	\$291,591	68.704	\$20,033,470	99.364	\$28,973,628
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.745	\$1,736,717	0.700	\$1,632,910
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$21,855,075		\$26,136,269
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	65.250	\$47,018,087	85.248	\$61,428,508
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	65.250	\$38,887,140	85.248	\$50,805,533
3	Wayside Protection System	km	\$57,213	65.250	\$3,733,165	85.248	\$4,877,331
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	65.250	\$24,039,323	85.248	\$31,407,057
2	Traction Power Distribution	km	\$686,995	65.250	\$44,826,266	85.248	\$58,564,924
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$221,856,593		\$259,136,908
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$217,506,464		\$254,055,792
<b>Total Construction</b>					<b>\$728,502,507</b>		<b>\$871,208,980</b>
<b>Total Construction and Right of Way</b>					<b>\$870,025,856</b>		<b>\$1,016,223,167</b>
<b>Grand Total</b>					<b>\$1,309,388,913</b>		<b>\$1,529,415,867</b>

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				UPRR: to Merced Municipal Airport Station (Alignment C9)		UPRR: to Merced Municipal Airport Station (Alignment C10)	
Alignment Cost							
Track				Item	Item Cost	Item	Item Cost
1	Double Track Section - Total	km		60.146		60.641	
2	Double Track Section - At-Grade	km	\$846,282	48.871	\$41,358,653	49.241	\$41,671,777
3	Double Track Section - On Structure	km	\$1,600,459	11.275	\$18,045,178	11.400	\$18,245,235
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	133.596	\$1,375,247	131.953	\$1,358,332
2	Total Cut	m3	\$7.59	333,989.6	\$2,533,350	329,881.8	\$2,502,191
3	Total Fill	m3	\$7.59	333,989.6	\$2,533,350	329,881.8	\$2,502,191
6	Landscape/Erosion Control	Hectares	\$6,881	1.280	\$8,807	1.920	\$13,211
7	Security Fencing (Both Sides of R/W)	km	\$86,687	48.871	\$4,236,482	49.241	\$4,268,556
8	Special Drainage Facilities	5% of Earthwork Cost			\$534,362		\$532,224
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	6.650	\$77,823,279	6.900	\$80,748,966
2	High Structure	km	\$14,043,299	4.200	\$58,981,854	4.200	\$58,981,854
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.875	\$17,237,500	0.750	\$14,775,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	3.700	\$13,872,092	6.850	\$25,682,116
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	22	\$121,578,557	19	\$104,999,662
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	14	\$13,046,398	8	\$7,455,084
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	6	\$35,108,246	6	\$35,108,246
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	2	\$1,972,130
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	3	\$455,107	3	\$455,107
Building Items							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	205	\$418,610	205	\$418,610
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	2.000	\$2,167,176	2.000	\$2,167,176
2	Single Track Relocation (Permanent)	km	\$1,083,588	8.313	\$9,007,866	8.313	\$9,007,866
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	8.050	\$3,271,081	8.050	\$3,271,081
7	Major Utility Relocations - Suburban	km	\$232,971	33.600	\$7,827,839	33.600	\$7,827,839
8	Major Utility Relocations - Undeveloped	km	\$11,919	18.496	\$220,462	18.993	\$226,386
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	12.236	\$14,271,634	12.236	\$14,271,634
	Suburban	hectare	\$408,227	81.624	\$33,321,157	81.624	\$33,321,157
	Undeveloped	hectare	\$291,591	56.228	\$16,395,534	54.965	\$16,027,220
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	1.153	\$470,686	1.153	\$470,686
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation							
1	Environmental Mitigation	3% of Line Cost			\$18,364,486		\$18,117,876
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	60.146	\$43,340,361	60.641	\$43,697,051
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	60.146	\$35,845,411	60.641	\$36,140,418
3	Wayside Protection System	km	\$57,213	60.146	\$3,441,159	60.641	\$3,469,480
Electrification Items							
1	Traction Power Supply	km	\$368,420	60.146	\$22,158,981	60.641	\$22,341,349
2	Traction Power Distribution	km	\$686,995	60.146	\$41,319,983	60.641	\$41,660,045
Vehicle Costs							
1	Fleet Size Estimate				\$0		\$0
Support Facility Costs							
1	Facility Cost Breakdown						
Program Implementation Costs							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$177,218,119		\$174,965,128
Contingencies							
1	Contingencies	25% of Total Construction Cost			\$173,743,254		\$171,534,440
Total Construction					\$612,149,518	\$603,929,185	
Total Construction and Right of Way					\$694,973,016	\$686,137,758	
Grand Total					\$1,045,934,389	\$1,032,637,326	

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Merced Municipal Airport Station (Alignment C11)		BNSF: to Merced Municipal Airport Station (Alignment C12)	
Alignment Cost							
Track				Item	Item Cost	Item	Item Cost
1	Double Track Section - Total	km		66.253		66.748	
2	Double Track Section - At-Grade	km	\$846,282	62.337	\$52,754,857	62.707	\$53,067,981
3	Double Track Section - On Structure	km	\$1,600,459	3.916	\$6,267,078	4.041	\$6,467,136
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	191.985	\$1,976,311	190.342	\$1,959,397
2	Total Cut	m3	\$7.59	479,962.8	\$3,640,573	475,855.0	\$3,609,415
3	Total Fill	m3	\$7.59	479,962.8	\$3,640,573	475,855.0	\$3,609,415
6	Landscape/Erosion Control	Hectares	\$6,881	0.960	\$6,606	1.600	\$11,009
7	Security Fencing (Both Sides of R/W)	km	\$86,687	62.337	\$5,403,827	62.707	\$5,435,901
8	Special Drainage Facilities	5% of Earthwork Cost			\$733,394		\$731,257
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	2.600	\$30,427,147	2.850	\$33,352,834
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.250	\$6,151,500	0.250	\$6,151,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.835	\$16,449,500	0.710	\$13,987,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	4.800	\$17,996,227	7.950	\$29,806,251
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	27	\$149,210,047	27	\$149,210,047
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	18	\$16,773,940	17	\$15,842,054
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	11	\$64,365,118	11	\$64,365,118
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	2	\$1,972,130
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
Building Items							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	205	\$418,610	205	\$418,610
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	4.800	\$5,201,222	4.800	\$5,201,222
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.250	\$1,354,485	1.250	\$1,354,485
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	3.700	\$1,503,478	3.700	\$1,503,478
7	Major Utility Relocations - Suburban	km	\$232,971	32.250	\$7,513,327	32.250	\$7,513,327
8	Major Utility Relocations - Undeveloped	km	\$11,919	30.301	\$361,172	30.798	\$367,096
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	11.248	\$13,119,266	11.248	\$13,119,266
	Suburban	hectare	\$408,227	92.568	\$37,788,798	92.568	\$37,788,798
	Undeveloped	hectare	\$291,591	89.987	\$26,239,414	88.724	\$25,871,100
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	1.153	\$470,686	1.153	\$470,686
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation							
1	Environmental Mitigation	3% of Line Cost			\$17,642,966		\$18,033,506
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	66.253	\$47,740,979	66.748	\$48,097,669
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	66.253	\$39,485,020	66.748	\$39,780,027
3	Wayside Protection System	km	\$57,213	66.253	\$3,790,562	66.748	\$3,818,883
Electrification Items							
1	Traction Power Supply	km	\$368,420	66.253	\$24,408,922	66.748	\$24,591,289
2	Traction Power Distribution	km	\$686,995	66.253	\$45,515,460	66.748	\$45,855,522
Vehicle Costs							
1	Fleet Size Estimate				\$0		\$0
Support Facility Costs							
1	Facility Cost Breakdown						
Program Implementation Costs							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$174,256,801		\$177,582,055
Contingencies							
1	Contingencies	25% of Total Construction Cost			\$170,840,001		\$174,100,054
Total Construction					\$588,098,872		\$601,116,861
Total Construction and Right of Way					\$683,360,003		\$696,400,217
Grand Total					\$1,028,456,805		\$1,048,082,327



**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Castle Air Force Base Station (Alignment C13)		BNSF: to Castle Air Force Base Station (Alignment C14)	
<b>Alignment Cost</b>							
<b>Track</b>				<b>Item</b>	<b>Item Cost</b>	<b>Item</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		80.396		79.379	
2	Double Track Section - At-Grade	km	\$846,282	75.355	\$63,771,758	74.314	\$62,890,947
3	Double Track Section - On Structure	km	\$1,600,459	5.041	\$8,067,595	5.065	\$8,105,686
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	230.490	\$2,372,681	219.044	\$2,254,859
2	Total Cut	m3	\$7.59	576,224.4	\$4,370,728	547,610.4	\$4,153,688
3	Total Fill	m3	\$7.59	576,224.4	\$4,370,728	547,610.4	\$4,153,688
6	Landscape/Erosion Control	Hectares	\$6,881	1.280	\$8,807	0.640	\$4,404
7	Security Fencing (Both Sides of R/W)	km	\$86,687	75.355	\$6,532,318	74.314	\$6,442,094
8	Special Drainage Facilities		5% of Earthwork Cost		\$882,763		\$850,437
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	3.700	\$43,300,170	3.500	\$40,959,621
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.250	\$6,151,500	0.250	\$6,151,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.805	\$15,858,500	0.691	\$13,612,700
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567		\$0		\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	6.300	\$23,620,048	3.100	\$11,622,563
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	40	\$221,051,921	38	\$209,999,325
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	25	\$23,297,139	20	\$18,637,711
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	8	\$122,228,709
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	11	\$64,365,118	11	\$64,365,118
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	205	\$418,610	205	\$418,610
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	4.800	\$5,201,222	8.400	\$9,102,138
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.250	\$1,354,485	1.250	\$1,354,485
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345	3.700	\$1,503,478	3.700	\$1,503,478
7	Major Utility Relocations - Suburban	km	\$232,971	39.893	\$9,293,928	37.379	\$8,708,237
8	Major Utility Relocations - Undeveloped	km	\$11,919	36.801	\$438,648	31.300	\$373,079
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	12.160	\$28,365,982
	Dense Suburban	hectare	\$1,166,364	11.248	\$13,119,266	11.248	\$13,119,266
	Suburban	hectare	\$408,227	112.991	\$46,125,913	105.804	\$43,192,162
	Undeveloped	hectare	\$291,591	109.747	\$32,001,253	93.024	\$27,124,964
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.869	\$354,750	0.869	\$354,750
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$22,096,141		\$26,239,736
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	80.396	\$57,932,226	79.379	\$57,199,390
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	80.396	\$47,913,871	79.379	\$47,307,766
3	Wayside Protection System	km	\$57,213	80.396	\$4,599,732	79.379	\$4,541,546
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	80.396	\$29,619,484	79.379	\$29,244,801
2	Traction Power Distribution	km	\$686,995	80.396	\$55,231,626	79.379	\$54,532,952
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$216,810,013		\$258,328,959
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$212,558,836		\$253,263,685
<b>Total Construction</b>					<b>\$736,538,022</b>		<b>\$874,657,879</b>
<b>Total Construction and Right of Way</b>					<b>\$850,235,345</b>		<b>\$1,013,054,740</b>
<b>Grand Total</b>					<b>\$1,279,604,194</b>		<b>\$1,524,647,384</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor C: Modesto to Merced**

DESCRIPTION		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Castle Air Force Base Station (Alignment C15)		BNSF: to Castle Air Force Base Station (Alignment C16)	
Alignment Cost							
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		80.891		79.393	
2	Double Track Section - At-Grade	km	\$846,282	75.725	\$64,084,882	74.394	\$62,958,650
3	Double Track Section - On Structure	km	\$1,600,459	5.166	\$8,267,652	4.999	\$8,000,056
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	228.847	\$2,355,767	219.087	\$2,255,297
2	Total Cut	m3	\$7.59	572,116.6	\$4,339,570	547,716.8	\$4,154,495
3	Total Fill	m3	\$7.59	572,116.6	\$4,339,570	547,716.8	\$4,154,495
6	Landscape/Erosion Control	Hectares	\$6,881	1.920	\$13,211	0.640	\$4,404
7	Security Fencing (Both Sides of R/W)	km	\$86,687	75.725	\$6,564,393	74.394	\$6,449,029
8	Special Drainage Facilities	5% of Earthwork Cost			\$880,626		\$850,886
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	3.950	\$46,225,858	3.500	\$40,959,621
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.250	\$6,151,500	0.250	\$6,151,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.680	\$13,396,000	0.600	\$11,820,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	9.450	\$35,430,072	3.100	\$11,622,563
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	40	\$221,051,921	39	\$215,525,623
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	24	\$22,365,253	20	\$18,637,711
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	8	\$122,228,709
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	11	\$64,365,118	11	\$64,365,118
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	2	\$1,972,130	2	\$1,972,130
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
Building Items							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Merced Downtown Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Merced Municipal Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Castle Air Force Base Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	205	\$418,610	205	\$418,610
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	4.800	\$5,201,222	8.000	\$8,668,703
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.250	\$1,354,485	1.250	\$1,354,485
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345	3.700	\$1,503,478	3.700	\$1,503,478
7	Major Utility Relocations - Suburban	km	\$232,971	39.893	\$9,293,928	38.893	\$9,060,956
8	Major Utility Relocations - Undeveloped	km	\$11,919	37.298	\$444,572	29.800	\$355,200
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	12.160	\$28,365,982
	Dense Suburban	hectare	\$1,166,364	11.248	\$13,119,266	11.248	\$13,119,266
	Suburban	hectare	\$408,227	112.991	\$46,125,913	110.407	\$45,071,054
	Undeveloped	hectare	\$291,591	108.484	\$31,632,938	88.464	\$25,795,309
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.869	\$354,750	0.869	\$354,750
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation							
1	Environmental Mitigation	3% of Line Cost			\$22,486,680		\$26,319,370
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	80.891	\$58,288,916	79.393	\$57,209,478
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	80.891	\$48,208,878	79.393	\$47,316,109
3	Wayside Protection System	km	\$57,213	80.891	\$4,628,052	79.393	\$4,542,347
Electrification Items							
1	Traction Power Supply	km	\$368,420	80.891	\$29,801,852	79.393	\$29,249,959
2	Traction Power Distribution	km	\$686,995	80.891	\$55,571,688	79.393	\$54,542,570
Vehicle Costs							
1	Fleet Size Estimate				\$0		\$0
Support Facility Costs							
1	Facility Cost Breakdown						
Program Implementation Costs							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$220,135,267		\$259,166,206
Contingencies							
1	Contingencies	25% of Total Construction Cost			\$215,818,890		\$254,084,516
Total Construction					\$749,556,010	\$877,312,334	
Total Construction and Right of Way					\$863,275,559	\$1,016,338,065	
Grand Total					\$1,299,229,716	\$1,529,588,787	

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor D: Merced to Fresno**

Cost Elements		UNIT	UNIT PRICE	QUANTITIES			
				BNSF: to Fresno DT Station (Alignment D1)		BNSF: to Fresno DT Station (Alignment D2)	
Alignment Cost							
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		100.999		142.218	
2	Double Track Section - At-Grade	km	\$846,282	93.923	\$79,485,185	131.867	\$111,596,344
3	Double Track Section - On Structure	km	\$1,600,459	7.076	\$11,325,490	10.351	\$16,566,994
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	280.729	\$2,889,846	386.749	\$3,981,225
2	Total Cut	m3	\$7.59	694,222.0	\$5,265,754	959,272.0	\$7,276,188
3	Total Fill	m3	\$7.59	694,222.0	\$5,265,754	959,272.0	\$7,276,188
6	Landscape/Erosion Control	Hectares	\$6,881	2.240	\$15,413	3.840	\$26,422
7	Security Fencing (Both Sides of R/W)	km	\$86,687	93.923	\$8,141,888	131.867	\$11,431,124
8	Special Drainage Facilities	5% of Earthwork Cost			\$1,078,933		\$1,499,557
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	5.650	\$66,120,530	7.775	\$90,988,872
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.700	\$17,224,200	0.700	\$17,224,200
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.815	\$16,055,500	0.815	\$16,055,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	8.850	\$33,180,543	16.225	\$60,830,996
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	8	\$117,027,488	8	\$117,027,488
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	17	\$93,947,066	53	\$292,893,795
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	21	\$19,569,597	33	\$30,752,223
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	2	\$11,702,749	2	\$11,702,749
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	1	\$986,065	1	\$986,065
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	3	\$455,107	3	\$455,107
Building Items							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Fresno Downtown Intermediate Station	ea	\$32,522,000	1	\$32,522,000	1	\$32,522,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	994	\$14,158,536	994	\$14,158,536
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	8.800	\$9,535,573	8.800	\$9,535,573
2	Single Track Relocation (Permanent)	km	\$1,083,588	42.801	\$46,378,643	42.801	\$46,378,643
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	21.000	\$12,174,109	21.000	\$12,174,109
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	2.750	\$1,117,450
7	Major Utility Relocations - Suburban	km	\$232,971	23.000	\$5,358,342	48.170	\$11,222,232
8	Major Utility Relocations - Undeveloped	km	\$11,919	57.000	\$679,410	70.300	\$837,938
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	46.360	\$108,145,305	37.240	\$86,870,819
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	6.308	\$7,357,426
	Suburban	hectare	\$408,227	67.412	\$27,519,429	139.825	\$57,080,321
	Undeveloped	hectare	\$291,591	173.280	\$50,526,894	211.128	\$61,563,032
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	2.050	\$4,782,094	1.770	\$4,128,930
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation							
1	Environmental Mitigation	3% of Line Cost			\$27,968,479		\$40,451,538
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	100.999	\$72,778,601	142.218	\$102,480,288
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	100.999	\$60,192,828	142.218	\$84,758,133
3	Wayside Protection System	km	\$57,213	100.999	\$5,778,512	142.218	\$8,136,781
Electrification Items							
1	Traction Power Supply	km	\$368,420	100.999	\$37,210,112	142.218	\$52,395,937
2	Traction Power Distribution	km	\$686,995	100.999	\$69,385,915	142.218	\$97,703,012
Vehicle Costs							
1	Fleet Size Estimate				\$0		\$0
Support Facility Costs							
1	Facility Cost Breakdown						
Program Implementation Costs							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$293,562,332		\$409,488,353
Contingencies							
1	Contingencies	25% of Total Construction Cost			\$287,806,208		\$401,459,170
Total Construction					\$932,282,632	\$1,348,384,613	
Total Construction and Right of Way					\$1,151,224,832	\$1,605,836,680	
Grand Total					\$1,732,593,373	\$2,416,784,203	

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor D: Merced to Fresno**

Cost Elements		UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost				BNSF: to Fresno DT Station (Alignment D3)		BNSF: to Fresno DT Station (Alignment D4)	
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		92.271		130.093	
2	Double Track Section - At-Grade	km	\$846,282	84.778	\$71,745,935	119.500	\$101,130,374
3	Double Track Section - On Structure	km	\$1,600,459	7.493	\$11,992,881	10.593	\$16,954,305
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	248.462	\$2,557,691	338.113	\$3,480,568
2	Total Cut	m3	\$7.59	613,555.6	\$4,653,890	837,683.4	\$6,353,925
3	Total Fill	m3	\$7.59	613,555.6	\$4,653,890	837,683.4	\$6,353,925
6	Landscape/Erosion Control	Hectares	\$6,881	2.880	\$19,817	5.760	\$39,633
7	Security Fencing (Both Sides of R/W)	km	\$86,687	84.778	\$7,349,136	119.500	\$10,359,065
8	Special Drainage Facilities		5% of Earthwork Cost		\$961,721		\$1,329,356
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	6.250	\$73,142,180	8.200	\$95,962,540
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.700	\$17,224,200	0.700	\$17,224,200
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.815	\$16,055,500	0.840	\$16,548,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	10.850	\$40,678,971	23.100	\$86,606,842
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	8	\$117,027,488	8	\$117,027,488
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	6	\$33,157,788	31	\$171,315,239
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	21	\$19,569,597	33	\$30,752,223
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	6	\$35,108,246	6	\$35,108,246
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	1	\$986,065	1	\$986,065
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	3	\$455,107	3	\$455,107
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Fresno Downtown Intermediate Station	ea	\$32,522,000	1	\$32,522,000	1	\$32,522,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	994	\$14,158,536	994	\$14,158,536
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	9.200	\$9,969,008	9.200	\$9,969,008
2	Single Track Relocation (Permanent)	km	\$1,083,588	42.955	\$46,545,516	42.955	\$46,545,516
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	24.272	\$14,070,952	24.272	\$14,070,952
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	1.400	\$568,884
7	Major Utility Relocations - Suburban	km	\$232,971	11.000	\$2,562,685	34.166	\$7,959,700
8	Major Utility Relocations - Undeveloped	km	\$11,919	57.000	\$679,410	70.257	\$837,426
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	51.485	\$120,101,566	42.365	\$98,827,080
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	4.256	\$4,964,047
	Suburban	hectare	\$408,227	30.932	\$12,627,291	90.869	\$37,095,073
	Undeveloped	hectare	\$291,591	173.280	\$50,526,894	210.047	\$61,247,904
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	2.050	\$4,782,094	1.770	\$4,128,930
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$26,351,555		\$37,110,970
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	92.271	\$66,489,327	130.093	\$93,743,184
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	92.271	\$54,991,173	130.093	\$77,531,957
3	Wayside Protection System	km	\$57,213	92.271	\$5,279,153	130.093	\$7,443,068
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	92.271	\$33,994,543	130.093	\$47,928,846
2	Traction Power Distribution	km	\$686,995	92.271	\$63,389,825	130.093	\$89,373,201
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$278,657,516		\$377,503,612
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$273,193,644		\$370,101,581
<b>Total Construction</b>					<b>\$878,385,174</b>		<b>\$1,237,032,320</b>
<b>Total Construction and Right of Way</b>					<b>\$1,092,774,574</b>		<b>\$1,480,406,322</b>
<b>Grand Total</b>					<b>\$1,644,625,735</b>		<b>\$2,228,011,515</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor D: Merced to Fresno**

Cost Elements		UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost				UPRR: to Fresno DT Station (Alignment D5)		UPRR: to Fresno DT Station (Alignment D6)	
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		88.000		123.741	
2	Double Track Section - At-Grade	km	\$846,282	77.979	\$65,992,233	111.270	\$94,165,810
3	Double Track Section - On Structure	km	\$1,600,459	10.021	\$16,038,202	12.471	\$19,959,327
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	211.964	\$2,181,975	293.827	\$3,024,676
2	Total Cut	m3	\$7.59	529,910.0	\$4,019,428	734,566.6	\$5,571,772
3	Total Fill	m3	\$7.59	529,910.0	\$4,019,428	734,566.6	\$5,571,772
6	Landscape/Erosion Control	Hectares	\$6,881	3.840	\$26,422	6.720	\$46,239
7	Security Fencing (Both Sides of R/W)	km	\$86,687	77.979	\$6,759,768	111.270	\$9,645,666
8	Special Drainage Facilities		5% of Earthwork Cost		\$850,351		\$1,193,006
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	6.000	\$70,216,493	9.100	\$106,495,014
2	High Structure	km	\$14,043,299	3.100	\$43,534,225	1.950	\$27,384,432
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.750	\$18,454,500	1.250	\$30,757,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.221	\$4,353,700	0.276	\$5,437,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	14.750	\$55,300,906	27.900	\$104,603,069
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	8	\$117,027,488	8	\$117,027,488
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	3	\$16,578,894	30	\$165,788,941
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	25	\$23,297,139	33	\$30,752,223
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	21	\$320,850,362	21	\$320,850,362
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	5	\$29,256,872	5	\$29,256,872
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	1	\$986,065	1	\$986,065
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Fresno Downtown Intermediate Station	ea	\$32,522,000	1	\$32,522,000	1	\$32,522,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	994	\$14,158,536	994	\$14,158,536
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	7.200	\$7,801,833	7.200	\$7,801,833
2	Single Track Relocation (Permanent)	km	\$1,083,588	43.026	\$46,622,451	43.026	\$46,622,451
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	29.300	\$16,985,781	29.300	\$16,985,781
6	Major Utility Relocations - Dense Suburban	km	\$406,345	5.850	\$2,377,121	5.850	\$2,377,121
7	Major Utility Relocations - Suburban	km	\$232,971	1.050	\$244,620	25.791	\$6,008,565
8	Major Utility Relocations - Undeveloped	km	\$11,919	51.800	\$617,428	62.800	\$748,542
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	59.128	\$137,929,585	50.008	\$116,655,099
	Dense Suburban	hectare	\$1,166,364	8.892	\$10,371,312	8.892	\$10,371,312
	Suburban	hectare	\$408,227	1.596	\$651,531	69.285	\$28,283,892
	Undeveloped	hectare	\$291,591	156.180	\$45,540,688	182.438	\$53,197,285
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	1.764	\$4,114,934	1.764	\$4,114,934
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$34,063,485		\$45,208,174
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	88.000	\$63,411,561	123.741	\$89,166,022
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	88.000	\$52,445,652	123.741	\$73,746,334
3	Wayside Protection System	km	\$57,213	88.000	\$5,034,783	123.741	\$7,079,648
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	88.000	\$32,420,948	123.741	\$45,588,643
2	Traction Power Distribution	km	\$686,995	88.000	\$60,455,533	123.741	\$85,009,411
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$348,870,865		\$450,016,305
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$342,030,260		\$441,192,456
<b>Total Construction</b>					<b>\$1,135,449,506</b>		<b>\$1,506,939,130</b>
<b>Total Construction and Right of Way</b>					<b>\$1,368,121,041</b>		<b>\$1,764,769,825</b>
<b>Grand Total</b>					<b>\$2,059,022,166</b>		<b>\$2,655,978,587</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor D: Merced to Fresno**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR: to Fresno DT Station (Alignment D7)		UPRR: to Fresno DT Station (Alignment D8)	
Track					Quantities		Item Cost	
							Quantities	Item Cost
1	Double Track Section - Total	km			96.728		135.866	
2	Double Track Section - At-Grade	km		\$846,282	87.124	\$73,731,482	123.637	\$104,631,781
3	Double Track Section - On Structure	km		\$1,600,459	9.604	\$15,370,811	12.229	\$19,572,016
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km		\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	244.231	\$2,514,130	342.462	\$3,525,334
2	Total Cut	m3		\$7.59	610,576.4	\$4,631,292	856,155.2	\$6,494,036
3	Total Fill	m3		\$7.59	610,576.4	\$4,631,292	856,155.2	\$6,494,036
6	Landscape/Erosion Control	Hectares		\$6,881	3.200	\$22,019	4.800	\$33,028
7	Security Fencing (Both Sides of R/W)	km		\$86,687	87.124	\$7,552,521	123.637	\$10,717,724
8	Special Drainage Facilities			5% of Earthwork Cost		\$967,563		\$1,363,208
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	5.400	\$63,194,843	8.675	\$101,521,345
2	High Structure	km		\$14,043,299	3.100	\$43,534,225	1.950	\$27,384,432
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km		\$24,606,000	0.750	\$18,454,500	1.250	\$30,757,500
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.221	\$4,353,700	0.251	\$4,944,700
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379		\$0		\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567				
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	12.750	\$47,802,478	21.025	\$78,827,223
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	8	\$117,027,488	8	\$117,027,488
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	14	\$77,368,172	52	\$287,367,497
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	25	\$23,297,139	33	\$30,752,223
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	21	\$320,850,362	21	\$320,850,362
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	1	\$5,851,374	1	\$5,851,374
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	1	\$986,065	1	\$986,065
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	4	\$606,809	4	\$606,809
Building Items								
1	Intermediate Passenger Stations	ea		N/A	1		1	
	Fresno Downtown Intermediate Station	ea		\$32,522,000	1	\$32,522,000	1	\$32,522,000
2	Terminal Passenger Stations	ea		N/A	0		0	
3	Parking - Structure	space		\$14,244	994	\$14,158,536	994	\$14,158,536
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	6.800	\$7,368,397	6.800	\$7,368,397
2	Single Track Relocation (Permanent)	km		\$1,083,588	42.872	\$46,455,578	42.872	\$46,455,578
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km		\$579,719	26.028	\$15,088,939	26.028	\$15,088,939
6	Major Utility Relocations - Dense Suburban	km		\$406,345	5.850	\$2,377,121	7.200	\$2,925,687
7	Major Utility Relocations - Suburban	km		\$232,971	13.050	\$3,040,277	39.795	\$9,271,096
8	Major Utility Relocations - Undeveloped	km		\$11,919	51.800	\$617,428	62.843	\$749,055
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	54.003	\$125,973,324	44.883	\$104,698,838
	Dense Suburban	hectare		\$1,166,364	8.892	\$10,371,312	10.944	\$12,764,692
	Suburban	hectare		\$408,227	38.076	\$15,543,668	118.241	\$48,269,140
	Undeveloped	hectare		\$291,591	156.180	\$45,540,688	183.519	\$53,512,413
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	1.764	\$4,114,934	1.764	\$4,114,934
	Dense Suburban	hectare		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare		\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation			3% of Line Cost		\$35,680,409		\$48,548,743
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	96.728	\$69,700,835	135.866	\$97,903,126
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	96.728	\$57,647,307	135.866	\$80,972,511
3	Wayside Protection System	km		\$57,213	96.728	\$5,534,141	135.866	\$7,773,361
Electrification Items								
1	Traction Power Supply	km		\$368,420	96.728	\$35,636,517	135.866	\$50,055,734
2	Traction Power Distribution	km		\$686,995	96.728	\$66,451,623	135.866	\$93,339,221
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Facility Cost Breakdown							
Program Implementation Costs								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$363,775,681		\$482,001,046
Contingencies								
1	Contingencies			25% of Total Construction Cost		\$356,642,825		\$472,550,046
Total Construction						\$1,189,346,964		\$1,618,291,423
Total Construction and Right of Way						\$1,426,571,299		\$1,890,200,182
Grand Total						\$2,146,989,804		\$2,844,751,274



**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor E: Fresno to Tulare**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR: to Visalia Airport Station (Alignment E1)		BNSF: to Hanford Station (Alignment E2)	
Track					Quantities	Item Cost	Quantities	Item Cost
	1	Double Track Section - Total	km		50.000		47.817	
	2	Double Track Section - At-Grade	km	\$846,282	44.023	\$37,255,877	44.764	\$37,882,803
	3	Double Track Section - On Structure	km	\$1,600,459	5.977	\$9,565,945	3.053	\$4,886,522
	4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
	5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
		Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
	6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
	7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
	9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
	1	Site Preparation - Undeveloped	Hectares	\$10,294	130.948	\$1,347,990	132.976	\$1,368,863
	2	Total Cut	m3	\$7.59	327,370.0	\$2,483,139	332,439.2	\$2,521,590
	3	Total Fill	m3	\$7.59	327,370.0	\$2,483,139	332,439.2	\$2,521,590
	6	Landscape/Erosion Control	Hectares	\$6,881	2.240	\$15,413	0.640	\$4,404
	7	Security Fencing (Both Sides of R/W)	km	\$86,687	44.023	\$3,816,223	44.764	\$3,880,441
	8	Special Drainage Facilities	5% of Earthwork Cost			\$507,295		\$514,844
Structures/Tunnels/Walls								
	1	Standard Structure	km	\$11,702,749	6.700	\$78,408,417	2.600	\$30,427,147
	2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
	3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
		Waterway Crossing - Primary	km	\$24,606,000	0.325	\$7,996,950	0.150	\$3,690,900
		Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.277	\$5,456,900	0.230	\$4,531,000
	5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
	6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
	7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
	8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
	9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
	10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
	11	Crossovers	ea	\$80,782,844		\$0		\$0
	12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
	13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
	14	Trench Long	km	\$33,464,567				
	15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
	16	Retaining Walls	km	\$3,749,214	6.500	\$24,369,891	7.600	\$28,494,026
	17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
	18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
	1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
	2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	7	\$38,684,086	17	\$93,947,066
	3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	13	\$12,114,512	20	\$18,637,711
	7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
	8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	3	\$17,554,123	2	\$11,702,749
	9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	8	\$7,888,520	0	\$0
	10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
	21	Minor crossing closures	ea	\$151,702	1	\$151,702	1	\$151,702
Building Items								
	1	Intermediate Passenger Stations	ea	N/A	1		1	
		Vasalia Airport Intermediate Station	ea	\$28,715,500	1	\$28,715,500	0	\$0
		Hanford Intermediate Station	ea	\$28,715,500	0	\$0	1	\$28,715,500
	2	Terminal Passenger Stations	ea	N/A	0		0	
	3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
	4	Parking - At Grade	space	\$2,042	62	\$126,604	62	\$126,604
Rail and Utility Relocation								
	1	Single Track Relocation (Temporary)	km	\$1,083,588	3.200	\$3,467,481	0.400	\$433,435
	2	Single Track Relocation (Permanent)	km	\$1,083,588	7.000	\$7,585,115	3.248	\$3,519,493
	3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
	4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
	5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
	6	Major Utility Relocations - Dense Suburban	km	\$406,345	4.300	\$1,747,285	4.600	\$1,869,189
	7	Major Utility Relocations - Suburban	km	\$232,971	6.450	\$1,502,665	14.667	\$3,416,991
	8	Major Utility Relocations - Undeveloped	km	\$11,919	39.250	\$467,839	28.550	\$340,301
Right-of-Way								
	1	Right-of-Way Required for Each Segment						
		Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
		Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
		Dense Suburban	hectare	\$1,166,364	8.056	\$9,396,231	6.992	\$8,155,220
		Suburban	hectare	\$408,227	16.340	\$6,670,436	41.852	\$17,085,005
		Undeveloped	hectare	\$291,591	116.736	\$34,039,171	86.792	\$25,307,769
	2	Right-of-Way Required for Passenger Station & Parking Facilities				\$0		\$0
		Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
		Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
		Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
		Suburban	hectare	\$408,227	0.000	\$0	0.580	\$236,772
		Undeveloped	hectare	\$291,591	0.720	\$209,946	0.000	\$0
Environmental Impact Mitigation								
	1	Environmental Mitigation				\$12,455,159		\$11,992,240
Signals and Communication								
	1	Signaling (ATC)	km	\$720,586	50.000	\$36,029,296	47.817	\$34,456,257
	2	Communications (w/Fiber Optic Backbone)	km	\$595,973	50.000	\$29,798,666	47.817	\$28,497,656
	3	Wayside Protection System	km	\$57,213	50.000	\$2,860,672	47.817	\$2,735,775
Electrification Items								
	1	Traction Power Supply	km	\$368,420	50.000	\$18,420,993	47.817	\$17,616,733
	2	Traction Power Distribution	km	\$686,995	50.000	\$34,349,735	47.817	\$32,850,025
Vehicle Costs								
	1	Fleet Size Estimate						
Support Facility Costs								
	1	Facility Cost Breakdown				\$0		\$0
Program Implementation Costs								
	1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$121,875,444		\$117,942,172
Contingencies								
	1	Contingencies	25% of Total Construction Cost			\$119,485,729		\$115,629,580
Total Construction						\$415,171,974		\$399,741,317
Total Construction and Right of Way						\$477,942,917		\$462,518,322
Grand Total						\$719,304,091		\$696,090,074

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
<b>Alignment Cost</b>					<b>UPRR: to Bakersfield Airport Station (Alignment F1)</b>		<b>UPRR: to Bakersfield Airport Station (Alignment F2)</b>
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total	km			129.465		116.000
2	Double Track Section - At-Grade	km	\$846,282		116.875	\$98,909,221	\$88,106,430
3	Double Track Section - On Structure	km	\$1,600,459		12.590	\$20,149,782	\$19,029,460
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459		0.000	\$0	\$0
5	Double Track Section - In Trench	km	\$1,600,459		0.000	\$0	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287		0.000	\$0	\$0
6	Freight Double Track	km	\$846,282				
7	Freight Single Track	km	\$423,141				
9	Four-track construction or reconstruction	km	\$1,692,564				
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	334.066	\$3,438,900	300.276	\$3,091,067
2	Total Cut	m3	\$7.59	835,164.0	\$6,334,815	750,690.0	\$5,694,070
3	Total Fill	m3	\$7.59	835,164.0	\$6,334,815	750,690.0	\$5,694,070
6	Landscape/Erosion Control	Hectares	\$6,881	3.840	\$26,422	3.200	\$22,019
7	Security Fencing (Both Sides of R/W)	km	\$86,687	116.875	\$10,131,546	104.110	\$9,024,986
8	Special Drainage Facilities	5% of Earthwork Cost			\$1,313,325		\$1,176,311
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	12.800	\$149,795,184	12.100	\$141,603,260
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.340	\$8,366,040	0.340	\$8,366,040
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.430	\$8,471,000	0.430	\$8,471,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	13.900	\$52,114,074	12.100	\$45,365,489
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	13	\$71,841,874	13	\$71,841,874
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	16	\$14,910,169	16	\$14,910,169
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	8	\$46,810,995	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702	1	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Bakersfield Airport Intermediate Station	ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Bakersfield Golden State Intermediate Station	ea	\$32,211,500	0	\$0	0	\$0
	Truxton (Union Avenue) Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Truxton (Amtrak) Intermediate Station	ea	\$165,048,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	855	\$12,178,620	855	\$12,178,620
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	6.000	\$6,501,527	3.600	\$3,900,916
2	Single Track Relocation (Permanent)	km	\$1,083,588	25.751	\$27,903,471	21.876	\$23,704,568
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	11.000	\$6,376,914	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345	12.300	\$4,998,049	12.300	\$4,998,049
7	Major Utility Relocations - Suburban	km	\$232,971	31.900	\$7,431,787	26.400	\$6,150,445
8	Major Utility Relocations - Undeveloped	km	\$11,919	74.265	\$885,199	70.300	\$837,938
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	16.720	\$39,003,225	10.640	\$24,820,234
	Dense Suburban	hectare	\$1,166,364	22.344	\$26,061,246	22.344	\$26,061,246
	Suburban	hectare	\$408,227	92.568	\$37,788,798	75.848	\$30,963,235
	Undeveloped	hectare	\$291,591	221.890	\$64,701,018	209.836	\$61,186,296
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	3.178	\$1,297,347	3.178	\$1,297,347
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation	3% of Line Cost			\$31,564,115		\$28,001,484
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	129.465	\$93,290,656	116.000	\$83,587,967
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	129.465	\$77,157,685	116.000	\$69,132,905
3	Wayside Protection System	km	\$57,213	129.465	\$7,407,138	116.000	\$6,636,759
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	129.465	\$47,697,478	116.000	\$42,736,705
2	Traction Power Distribution	km	\$686,995	129.465	\$88,941,768	116.000	\$79,691,385
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$319,400,994		\$281,956,726
<b>Contingencies</b>							
1	Contingencies	25% of Total Construction Cost			\$313,138,230		\$276,428,163
<b>Total Construction</b>					<b>\$1,052,137,170</b>		<b>\$933,382,808</b>
<b>Total Construction and Right of Way</b>					<b>\$1,252,552,918</b>		<b>\$1,105,712,650</b>
<b>Grand Total</b>					<b>\$1,885,092,142</b>		<b>\$1,664,097,538</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR (around Tulare): to Bakersfield Airport Station (Alignment F3)		UPRR (around Tulare): to Bakersfield Airport Station (Alignment F4)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			129.957		116.492	
2	Double Track Section - At-Grade	km		\$846,282	120.552	\$102,021,001	107.787	\$91,218,210
3	Double Track Section - On Structure	km		\$1,600,459	9.405	\$15,052,319	8.705	\$13,931,998
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282				
7	Freight Single Track	km		\$423,141				
9	Four-track construction or reconstruction	km		\$1,692,564				
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	333.977	\$3,437,992	300.188	\$3,090,159
2	Total Cut	m3		\$7.59	834,943.6	\$6,333,143	750.466	\$5,692,398
3	Total Fill	m3		\$7.59	834,943.6	\$6,333,143	750.466	\$5,692,398
6	Landscape/Erosion Control	Hectares		\$6,881	4.160	\$28,624	3.520	\$24,220
7	Security Fencing (Both Sides of R/W)	km		\$86,687	120.552	\$10,450,295	107.787	\$9,343,735
8	Special Drainage Facilities	5% of Earthwork Cost				\$1,329,160		\$1,192,146
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	9.600	\$112,346,388	8.900	\$104,154,464
2	High Structure	km		\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km		\$24,606,000	0.340	\$8,366,040	0.340	\$8,366,040
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.450	\$8,865,000	0.450	\$8,865,000
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379		\$0		\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567				
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	15.800	\$59,237,580	14.000	\$52,488,995
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	22	\$121,578,557	22	\$121,578,557
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	22	\$20,501,482	22	\$20,501,482
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	4	\$61,114,355	4	\$61,114,355
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	8	\$46,810,995	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	1	\$151,702	1	\$151,702
Building Items								
1	Intermediate Passenger Stations	ea		N/A	1		1	
	Bakersfield Airport Intermediate Station	ea		\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Bakersfield Golden State Intermediate Station	ea		\$32,211,500	0	\$0	0	\$0
	Truxton (Union Avenue) Intermediate Station	ea		\$32,430,000	0	\$0	0	\$0
	Truxton (Amtrak) Intermediate Station	ea		\$165,048,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea		N/A	0		0	
3	Parking - Structure	space		\$14,244	855	\$12,178,620	855	\$12,178,620
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	5.600	\$6,068,092	3.200	\$3,467,481
2	Single Track Relocation (Permanent)	km		\$1,083,588	21.501	\$23,298,222	17.626	\$19,099,319
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km		\$579,719	11.000	\$6,376,914	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km		\$406,345	8.900	\$3,616,474	8.900	\$3,616,474
7	Major Utility Relocations - Suburban	km		\$232,971	35.842	\$8,350,160	30.342	\$7,068,818
8	Major Utility Relocations - Undeveloped	km		\$11,919	74.215	\$884,603	70.250	\$837,343
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	16.720	\$39,003,225	10.640	\$24,820,234
	Dense Suburban	hectare		\$1,166,364	17.176	\$20,033,474	17.176	\$20,033,474
	Suburban	hectare		\$408,227	92.936	\$37,938,961	76.216	\$31,113,398
	Undeveloped	hectare		\$291,591	221.738	\$64,656,696	209.684	\$61,141,974
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	hectare		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare		\$408,227	3.178	\$1,297,347	3.178	\$1,297,347
	Undeveloped	hectare		\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation	3% of Line Cost				\$31,688,845		\$28,126,214
Signals and Communication								
1	Signalling (ATC)	km		\$720,586	129.957	\$93,645,184	116.492	\$83,942,495
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	129.957	\$77,450,904	116.492	\$69,426,124
3	Wayside Protection System	km		\$57,213	129.957	\$7,435,287	116.492	\$6,664,908
Electrification Items								
1	Traction Power Supply	km		\$368,420	129.957	\$47,878,741	116.492	\$42,917,967
2	Traction Power Distribution	km		\$686,995	129.957	\$89,279,770	116.492	\$80,029,386
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Facility Cost Breakdown							
Program Implementation Costs								
1	Program Implementation Costs	25.5% of Total Cost and Procurement				\$318,982,908		\$281,538,640
Contingencies								
1	Contingencies	25% of Total Construction Cost				\$312,728,341		\$276,018,274
Total Construction						\$1,056,294,817	\$937,540,455	
Total Construction and Right of Way						\$1,250,913,364	\$1,104,073,096	
Grand Total						\$1,882,624,613	\$1,661,630,010	

**Capital Cost Estimates  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
<b>Alignment Cost</b>					<b>BNSF: to Bakersfield Airport Station (Alignment F5)</b>		<b>BNSF: to Bakersfield Airport Station (Alignment F6)</b>
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total	km			143.220		129.755
2	Double Track Section - At-Grade	km	\$846,282		133.335	\$112,839,364	\$102,036,572
3	Double Track Section - On Structure	km	\$1,600,459		9.885	\$15,819,900	\$14,699,578
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459		0.000	\$0	\$0
5	Double Track Section - In Trench	km	\$1,600,459		0.000	\$0	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287		0.000	\$0	\$0
6	Freight Double Track	km	\$846,282				
7	Freight Single Track	km	\$423,141				
9	Four-track construction or reconstruction	km	\$1,692,564				
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294		340.085	\$3,500,862	\$3,153,029
2	Total Cut	m3	\$7.59		850,212.0	\$6,448,956	\$5,808,211
3	Total Fill	m3	\$7.59		850,212.0	\$6,448,956	\$5,808,211
6	Landscape/Erosion Control	Hectares	\$6,881		3.520	\$24,220	\$19,817
7	Security Fencing (Both Sides of R/W)	km	\$86,687		133.335	\$11,558,450	\$10,451,890
8	Special Drainage Facilities		5% of Earthwork Cost			\$1,399,072	\$1,262,058
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749		9.700	\$113,516,663	\$105,324,739
2	High Structure	km	\$14,043,299		0.000	\$0	\$0
3	Long Span Structure	km	\$32,020,021		0.000	\$0	\$0
	Waterway Crossing - Primary	km	\$24,606,000		0.195	\$4,798,170	\$4,798,170
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000		0.695	\$13,691,500	\$13,691,500
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150			\$0	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589			\$0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592			\$0	\$0
8	Double Track Drill & Blast	km	\$71,355,733			\$0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758			\$0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844			\$0	\$0
11	Crossovers	ea	\$80,782,844			\$0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379			\$0	\$0
13	Trench Short	km	\$42,322,835		0.000	\$0	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723		0.000	\$0	\$0
16	Retaining Walls	km	\$3,749,214		12.850	\$48,177,399	\$41,428,814
17	Containment Walls	km	\$1,278,634		0.000	\$0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987		0.000	\$0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436		4	\$58,513,744	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298		6	\$33,157,788	\$33,157,788
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886		44	\$41,002,964	\$41,002,964
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589		4	\$61,114,355	\$61,114,355
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374		6	\$35,108,246	\$5,851,374
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065		7	\$6,902,455	\$4,930,325
10	Street Bridging HSR Trench	ea			0	\$0	\$0
21	Minor crossing closures	ea	\$151,702		1	\$151,702	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A		1		1
	Bakersfield Airport Intermediate Station	ea	\$32,430,000		1	\$32,430,000	\$32,430,000
	Bakersfield Golden State Intermediate Station	ea	\$32,211,500		0	\$0	\$0
	Truxton (Union Avenue) Intermediate Station	ea	\$32,430,000		0	\$0	\$0
	Truxton (Amtrak) Intermediate Station	ea	\$165,048,000		0	\$0	\$0
2	Terminal Passenger Stations	ea	N/A		0		0
3	Parking - Structure	space	\$14,244		855	\$12,178,620	\$12,178,620
4	Parking - At Grade	space	\$2,042		0	\$0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588		4.800	\$5,201,222	\$2,600,611
2	Single Track Relocation (Permanent)	km	\$1,083,588		20.876	\$22,620,980	\$18,422,077
3	Single Track Removal	km	\$54,000		0.000	\$0	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511		0.000	\$0	\$0
5	Major Utility Relocations - Urban	km	\$579,719		11.000	\$6,376,914	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km	\$406,345		6.750	\$2,742,832	\$2,742,832
7	Major Utility Relocations - Suburban	km	\$232,971		19.763	\$4,604,214	\$3,322,871
8	Major Utility Relocations - Undeveloped	km	\$11,919		105.707	\$1,259,971	\$1,212,710
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093		0.000	\$0	\$0
	Urban	hectare	\$2,332,729		16.720	\$39,003,225	\$24,820,234
	Dense Suburban	hectare	\$1,166,364		12.084	\$14,094,347	\$14,094,347
	Suburban	hectare	\$408,227		57.572	\$23,502,275	\$16,676,712
	Undeveloped	hectare	\$291,591		268.453	\$78,278,569	\$74,763,848
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban	hectare	\$3,499,093		0.000	\$0	\$0
	Urban	hectare	\$2,332,729		0.000	\$0	\$0
	Dense Suburban	hectare	\$1,166,364		0.000	\$0	\$0
	Suburban	hectare	\$408,227		3.178	\$1,297,347	\$1,297,347
	Undeveloped	hectare	\$291,591		0.000	\$0	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost			\$30,284,931	\$26,722,301
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586		143.220	\$103,202,315	\$93,499,626
2	Communications (w/Fiber Optic Backbone)	km	\$595,973		143.220	\$85,355,298	\$77,330,518
3	Wayside Protection System	km	\$57,213		143.220	\$8,194,109	\$7,423,730
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420		143.220	\$52,765,094	\$47,804,320
2	Traction Power Distribution	km	\$686,995		143.220	\$98,391,380	\$89,140,997
<b>Vehicle Costs</b>							
1	Fleet Size Estimate					\$0	\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement			\$304,969,394	\$267,525,125
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost			\$298,989,602	\$262,279,535
<b>Total Construction</b>						<b>\$1,009,497,713</b>	<b>\$890,743,351</b>
<b>Total Construction and Right of Way</b>						<b>\$1,195,958,407</b>	<b>\$1,049,118,139</b>
<b>Grand Total</b>						<b>\$1,799,917,402</b>	<b>\$1,578,922,799</b>

**Capital Cost Estimates  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
<b>Alignment Cost</b>					<b>UPRR: to Golden State Station (Alignment F7)</b>		<b>UPRR: to Golden State Station (Alignment F8)</b>
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total	km			129.465		116.000
2	Double Track Section - At-Grade	km		\$846,282	116.875	\$98,909,221	\$88,106,430
3	Double Track Section - On Structure	km		\$1,600,459	12.590	\$20,149,782	\$19,029,460
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	\$0
6	Freight Double Track	km		\$846,282			
7	Freight Single Track	km		\$423,141			
9	Four-track construction or reconstruction	km		\$1,692,564			
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares		\$10,294	340.526	\$3,505,399	\$3,157,566
2	Total Cut	m3		\$7.59	851,314.0	\$6,457,315	\$5,816,570
3	Total Fill	m3		\$7.59	851,314.0	\$6,457,315	\$5,816,570
6	Landscape/Erosion Control	Hectares		\$6,881	3.840	\$26,422	\$22,019
7	Security Fencing (Both Sides of R/W)	km		\$86,687	116.875	\$10,131,546	\$9,024,986
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,328,900	\$1,191,886
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km		\$11,702,749	12.150	\$142,188,397	\$133,996,473
2	High Structure	km		\$14,043,299	0.000	\$0	\$0
3	Long Span Structure	km		\$32,020,021	0.000	\$0	\$0
	Waterway Crossing - Primary	km		\$24,606,000	0.435	\$10,703,610	\$10,703,610
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.535	\$10,539,500	\$10,539,500
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0	\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589		\$0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0	\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0	\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0	\$0
11	Crossovers	ea		\$80,782,844		\$0	\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379		\$0	\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	\$0
14	Trench Long	km		\$33,464,567			
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	\$0
16	Retaining Walls	km		\$3,749,214	13.900	\$52,114,074	\$45,365,489
17	Containment Walls	km		\$1,278,634	0.000	\$0	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	4	\$58,513,744	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	13	\$71,841,874	\$71,841,874
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	16	\$14,910,169	\$14,910,169
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	5	\$76,392,943	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	8	\$46,810,995	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	5	\$4,930,325	\$2,958,195
10	Street Bridging HSR Trench	ea			0	\$0	\$0
21	Minor crossing closures	ea		\$151,702	1	\$151,702	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea		N/A	1		1
	Bakersfield Airport Intermediate Station	ea		\$32,430,000	0	\$0	\$0
	Bakersfield Golden State Intermediate Station	ea		\$32,211,500	1	\$32,211,500	\$32,211,500
	Truxton (Union Avenue) Intermediate Station	ea		\$32,430,000	0	\$0	\$0
	Truxton (Amtrak) Intermediate Station	ea		\$165,048,000	0	\$0	\$0
2	Terminal Passenger Stations	ea		N/A	0		0
3	Parking - Structure	space		\$14,244	750	\$10,683,000	\$10,683,000
4	Parking - At Grade	space		\$2,042	0	\$0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km		\$1,083,588	6.000	\$6,501,527	\$3,900,916
2	Single Track Relocation (Permanent)	km		\$1,083,588	25.751	\$27,903,471	\$23,704,568
3	Single Track Removal	km		\$54,000	0.000	\$0	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0.000	\$0	\$0
5	Major Utility Relocations - Urban	km		\$579,719	11.000	\$6,376,914	\$4,058,036
6	Major Utility Relocations - Dense Suburban	km		\$406,345	12.300	\$4,998,049	\$4,998,049
7	Major Utility Relocations - Suburban	km		\$232,971	31.900	\$7,431,787	\$6,150,445
8	Major Utility Relocations - Undeveloped	km		\$11,919	74.265	\$885,199	\$837,938
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare		\$3,499,093	0.000	\$0	\$0
	Urban	hectare		\$2,332,729	22.496	\$52,477,066	\$38,294,075
	Dense Suburban	hectare		\$1,166,364	22.040	\$25,706,671	\$25,706,671
	Suburban	hectare		\$408,227	92.568	\$37,788,798	\$30,963,235
	Undeveloped	hectare		\$291,591	221.890	\$64,701,018	\$61,186,296
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban	hectare		\$3,499,093	0.000	\$0	\$0
	Urban	hectare		\$2,332,729	1.266	\$2,953,235	\$2,953,235
	Dense Suburban	hectare		\$1,166,364	0.000	\$0	\$0
	Suburban	hectare		\$408,227	0.000	\$0	\$0
	Undeveloped	hectare		\$291,591	0.000	\$0	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation			3% of Line Cost		\$31,426,482	\$27,863,851
<b>Signals and Communication</b>							
1	Signaling (ATC)	km		\$720,586	129.465	\$93,290,656	\$83,587,967
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	129.465	\$77,157,685	\$69,132,905
3	Wayside Protection System	km		\$57,213	129.465	\$7,407,138	\$6,636,759
<b>Electrification Items</b>							
1	Traction Power Supply	km		\$368,420	129.465	\$47,697,478	\$42,736,705
2	Traction Power Distribution	km		\$686,995	129.465	\$88,941,768	\$79,691,385
<b>Vehicle Costs</b>							
1	Fleet Size Estimate					\$0	\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$321,963,683	\$284,519,414
<b>Contingencies</b>							
1	Contingencies			25% of Total Construction Cost		\$315,650,669	\$278,940,602
<b>Total Construction</b>						<b>\$1,047,549,407</b>	<b>\$928,795,045</b>
<b>Total Construction and Right of Way</b>						<b>\$1,262,602,677</b>	<b>\$1,115,762,409</b>
<b>Grand Total</b>						<b>\$1,900,217,028</b>	<b>\$1,679,222,425</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR (around Tulare): to Golden State Station (Alignment F9)		UPRR (around Tulare): to Golden State Station (Alignment F10)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total		km		129.957		116.492	
2	Double Track Section - At-Grade		km	\$846,282	120.552	\$102,021,001	107.787	\$91,218,210
3	Double Track Section - On Structure		km	\$1,600,459	9.405	\$15,052,319	8.705	\$13,931,998
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282				
7	Freight Single Track		km	\$423,141				
9	Four-track construction or reconstruction		km	\$1,692,564				
Earthwork and Related Items								
1	Site Preparation - Undeveloped		Hectares	\$10,294	340.437	\$3,504,492	306.648	\$3,156,659
2	Total Cut		m3	\$7.59	851,093.6	\$6,455,643	766,619.6	\$5,814,898
3	Total Fill		m3	\$7.59	851,093.6	\$6,455,643	766,619.6	\$5,814,898
6	Landscape/Erosion Control		Hectares	\$6,881	4.160	\$28,624	3.520	\$24,220
7	Security Fencing (Both Sides of R/W)		km	\$86,687	120.552	\$10,450,295	107.787	\$9,343,735
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,344,735		\$1,207,720
Structures/Tunnels/Walls								
1	Standard Structure		km	\$11,702,749	8.950	\$104,739,601	8.250	\$96,547,677
2	High Structure		km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary		km	\$24,606,000	0.435	\$10,703,610	0.435	\$10,703,610
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0.555	\$10,933,500	0.555	\$10,933,500
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast		km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844		\$0		\$0
11	Crossovers		ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379		\$0		\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long		km	\$33,464,567				
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls		km	\$3,749,214	15.800	\$59,237,580	14.000	\$52,488,995
17	Containment Walls		km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	22	\$121,578,557	22	\$121,578,557
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	22	\$20,501,482	22	\$20,501,482
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	4	\$61,114,355	4	\$61,114,355
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	8	\$46,810,995	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	1	\$151,702	1	\$151,702
Building Items								
1	Intermediate Passenger Stations		ea	N/A	1		1	
	Bakersfield Airport Intermediate Station		ea	\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station		ea	\$32,211,500	1	\$32,211,500	1	\$32,211,500
	Truxton (Union Avenue) Intermediate Station		ea	\$32,430,000	0	\$0	0	\$0
	Truxton (Amtrak) Intermediate Station		ea	\$165,048,000	0	\$0	0	\$0
2	Terminal Passenger Stations		ea	N/A	0		0	
3	Parking - Structure		space	\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)		km	\$1,083,588	5.600	\$6,068,092	3.200	\$3,467,481
2	Single Track Relocation (Permanent)		km	\$1,083,588	21.501	\$23,298,222	17.626	\$19,099,319
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	11.000	\$6,376,914	7.000	\$4,058,036
6	Major Utility Relocations - Dense Suburban		km	\$406,345	8.900	\$3,616,474	8.900	\$3,616,474
7	Major Utility Relocations - Suburban		km	\$232,971	35.842	\$8,350,160	30.342	\$7,068,818
8	Major Utility Relocations - Undeveloped		km	\$11,919	74.215	\$884,603	70.250	\$837,343
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	22.496	\$52,477,066	16.416	\$38,294,075
	Dense Suburban		hectare	\$1,166,364	16.872	\$19,678,900	16.872	\$19,678,900
	Suburban		hectare	\$408,227	92.936	\$37,938,961	76.216	\$31,113,398
	Undeveloped		hectare	\$291,591	221.738	\$64,656,696	209.684	\$61,141,974
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	1.266	\$2,953,235	1.266	\$2,953,235
	Dense Suburban		hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		hectare	\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation			3% of Line Cost		\$31,551,212		\$27,988,581
Signals and Communication								
1	Signaling (ATC)		km	\$720,586	129.957	\$93,645,184	116.492	\$83,942,495
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	129.957	\$77,450,904	116.492	\$69,426,124
3	Wayside Protection System		km	\$57,213	129.957	\$7,435,287	116.492	\$6,664,908
Electrification Items								
1	Traction Power Supply		km	\$368,420	129.957	\$47,878,741	116.492	\$42,917,967
2	Traction Power Distribution		km	\$686,995	129.957	\$89,279,770	116.492	\$80,029,386
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Facility Cost Breakdown							
Program Implementation Costs								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$321,545,596		\$284,101,328
Contingencies								
1	Contingencies			25% of Total Construction Cost		\$315,240,781		\$278,530,714
Total Construction						\$1,051,707,054		\$932,952,692
Total Construction and Right of Way						\$1,260,963,123		\$1,114,122,855
Grand Total						\$1,897,749,500		\$1,676,754,897



**Capital Cost Estimates  
CAHSRA Program EIR/EIS  
SACRAMENTO TO BAKERSFIELD  
Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
<b>Alignment Cost</b>					<b>BNSF: to Golden State Station (Alignment F11)</b>		<b>BNSF: to Golden State Station (Alignment F12)</b>
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total		km		143.220		129.755
2	Double Track Section - At-Grade		km	\$846,282	133.335	\$112,839,364	\$102,036,572
3	Double Track Section - On Structure		km	\$1,600,459	9.885	\$15,819,900	\$14,699,578
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.000	\$0	\$0
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	\$0
6	Freight Double Track		km	\$846,282			
7	Freight Single Track		km	\$423,141			
9	Four-track construction or reconstruction		km	\$1,692,564			
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped		Hectares	\$10,294	346.545	\$3,567,361	\$3,219,528
2	Total Cut		m3	\$7.59	866,362.0	\$6,571,455	\$5,930,710
3	Total Fill		m3	\$7.59	866,362.0	\$6,571,455	\$5,930,710
6	Landscape/Erosion Control		Hectares	\$6,881	3.520	\$24,220	\$19,817
7	Security Fencing (Both Sides of R/W)		km	\$86,687	133.335	\$11,558,450	\$10,451,890
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,414,647	\$1,277,633
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure		km	\$11,702,749	9.050	\$105,909,876	\$97,717,952
2	High Structure		km	\$14,043,299	0.000	\$0	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	\$0
	Waterway Crossing - Primary		km	\$24,606,000	0.290	\$7,135,740	\$7,135,740
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0.800	\$15,760,000	\$15,760,000
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150		\$0	\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589		\$0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592		\$0	\$0
8	Double Track Drill & Blast		km	\$71,355,733		\$0	\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758		\$0	\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844		\$0	\$0
11	Crossovers		ea	\$80,782,844		\$0	\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379		\$0	\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	\$0
14	Trench Long		km	\$33,464,567			
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0	\$0
16	Retaining Walls		km	\$3,749,214	12.850	\$48,177,399	\$41,428,814
17	Containment Walls		km	\$1,278,634	0.000	\$0	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	4	\$58,513,744	\$43,885,308
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	6	\$33,157,788	\$33,157,788
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	44	\$41,002,964	\$41,002,964
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	4	\$61,114,355	\$61,114,355
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	6	\$35,108,246	\$5,851,374
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	7	\$6,902,455	\$4,930,325
10	Street Bridging HSR Trench		ea		0	\$0	\$0
21	Minor crossing closures		ea	\$151,702	1	\$151,702	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations		ea	N/A	1		1
	Bakersfield Airport Intermediate Station		ea	\$32,430,000	0	\$0	\$0
	Bakersfield Golden State Intermediate Station		ea	\$32,211,500	1	\$32,211,500	\$32,211,500
	Truxton (Union Avenue) Intermediate Station		ea	\$32,430,000	0	\$0	\$0
	Truxton (Amtrak) Intermediate Station		ea	\$165,048,000	0	\$0	\$0
2	Terminal Passenger Stations		ea	N/A	0		0
3	Parking - Structure		space	\$14,244	750	\$10,683,000	\$10,683,000
4	Parking - At Grade		space	\$2,042	0	\$0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)		km	\$1,083,588	4.800	\$5,201,222	\$2,600,611
2	Single Track Relocation (Permanent)		km	\$1,083,588	20.876	\$22,620,980	\$18,422,077
3	Single Track Removal		km	\$54,000	0.000	\$0	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	\$0
5	Major Utility Relocations - Urban		km	\$579,719	11.000	\$6,376,914	\$4,058,036
6	Major Utility Relocations - Dense Suburban		km	\$406,345	6.750	\$2,742,832	\$2,742,832
7	Major Utility Relocations - Suburban		km	\$232,971	19.763	\$4,604,214	\$3,322,871
8	Major Utility Relocations - Undeveloped		km	\$11,919	105.707	\$1,259,971	\$1,212,710
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban		hectare	\$3,499,093	0.000	\$0	\$0
	Urban		hectare	\$2,332,729	22.496	\$52,477,066	\$38,294,075
	Dense Suburban		hectare	\$1,166,364	11.780	\$13,739,772	\$13,739,772
	Suburban		hectare	\$408,227	57.572	\$23,502,275	\$16,676,712
	Undeveloped		hectare	\$291,591	268.453	\$78,278,569	\$74,763,848
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban		hectare	\$3,499,093	0.000	\$0	\$0
	Urban		hectare	\$2,332,729	1.266	\$2,953,235	\$2,953,235
	Dense Suburban		hectare	\$1,166,364	0.000	\$0	\$0
	Suburban		hectare	\$408,227	0.000	\$0	\$0
	Undeveloped		hectare	\$291,591	0.000	\$0	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation			3% of Line Cost		\$30,147,298	\$26,584,668
<b>Signals and Communication</b>							
1	Signaling (ATC)		km	\$720,586	143.220	\$103,202,315	\$93,499,626
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	143.220	\$85,355,298	\$77,330,518
3	Wayside Protection System		km	\$57,213	143.220	\$8,194,109	\$7,423,730
<b>Electrification Items</b>							
1	Traction Power Supply		km	\$368,420	143.220	\$52,765,094	\$47,804,320
2	Traction Power Distribution		km	\$686,995	143.220	\$98,391,380	\$89,140,997
<b>Vehicle Costs</b>							
1	Fleet Size Estimate					\$0	\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$307,532,082	\$270,087,814
<b>Contingencies</b>							
1	Contingencies			25% of Total Construction Cost		\$301,502,041	\$264,791,974
<b>Total Construction</b>						\$1,004,909,950	\$886,155,588
<b>Total Construction and Right of Way</b>						\$1,206,008,165	\$1,059,167,897
<b>Grand Total</b>						\$1,815,042,289	\$1,594,047,686

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR: to Truxtun (Union Ave Station) (Alignment F13)		UPRR (around Tulare): to Truxtun (Union Ave Station) (Alignment F14)	
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total		km		118.114		118.606	
2	Double Track Section - At-Grade		km	\$846,282	108.524	\$91,841,920	112.201	\$94,953,699
3	Double Track Section - On Structure		km	\$1,600,459	9.590	\$15,348,404	6.405	\$10,250,942
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282				
7	Freight Single Track		km	\$423,141				
9	Four-track construction or reconstruction		km	\$1,692,564				
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	318.483	\$3,278,486	318.394	\$3,277,579
2	Total Cut		m3	\$7.59	796,206.4	\$6,039,317	795,986.0	\$6,037,645
3	Total Fill		m3	\$7.59	796,206.4	\$6,039,317	795,986.0	\$6,037,645
6	Landscape/Erosion Control		Hectares	\$6,881	2.880	\$19,817	3.200	\$22,019
7	Security Fencing (Both Sides of R/W)		km	\$86,687	108.524	\$9,407,623	112.201	\$9,726,371
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,239,228		\$1,255,063
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	9.150	\$107,080,151	5.950	\$69,631,355
2	High Structure		km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary		km	\$24,606,000	0.340	\$8,366,040	0.340	\$8,366,040
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0.515	\$10,145,500	0.535	\$10,539,500
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast		km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844		\$0		\$0
11	Crossovers		ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379		\$0		\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long		km	\$33,464,567				
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls		km	\$3,749,214	11.500	\$43,115,960	13.400	\$50,239,467
17	Containment Walls		km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	20	\$292,568,719	20	\$292,568,719
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	13	\$71,841,874	22	\$121,578,557
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	16	\$14,910,169	22	\$20,501,482
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	2	\$30,557,177	1	\$15,278,589
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	3	\$17,554,123	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	3	\$2,958,195	3	\$2,958,195
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	1	\$151,702	1	\$151,702
<b>Building Items</b>								
1	Intermediate Passenger Stations		ea	N/A	1		1	
	Bakersfield Airport Intermediate Station		ea	\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station		ea	\$32,211,500	0	\$0	0	\$0
	Truxtun (Union Avenue) Intermediate Station		ea	\$32,430,000	1	\$32,430,000	1	\$32,430,000
	Truxtun (Amtrak) Intermediate Station		ea	\$165,048,000	0	\$0	0	\$0
2	Terminal Passenger Stations		ea	N/A	0		0	
3	Parking - Structure		space	\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	2.800	\$3,034,046	2.400	\$2,600,611
2	Single Track Relocation (Permanent)		km	\$1,083,588	14.751	\$15,984,004	10.501	\$11,378,756
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	9.114	\$5,283,564	9.114	\$5,283,564
6	Major Utility Relocations - Dense Suburban		km	\$406,345	12.300	\$4,998,049	8.900	\$3,616,474
7	Major Utility Relocations - Suburban		km	\$232,971	26.400	\$6,150,445	30.342	\$7,068,818
8	Major Utility Relocations - Undeveloped		km	\$11,919	70.300	\$837,938	70.250	\$837,343
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	26.187	\$61,086,141	26.187	\$61,086,141
	Dense Suburban		hectare	\$1,166,364	20.520	\$23,933,797	15.352	\$17,906,026
	Suburban		hectare	\$408,227	75.848	\$30,963,235	76.216	\$31,113,398
	Undeveloped		hectare	\$291,591	209.836	\$61,186,296	209.684	\$61,141,974
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	1.130	\$2,635,983	1.130	\$2,635,983
	Dense Suburban		hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>								
1	Environmental Mitigation			3% of Line Cost		\$32,963,574		\$33,088,303
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	118.114	\$85,111,285	118.606	\$85,465,813
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	118.114	\$70,392,792	118.606	\$70,686,011
3	Wayside Protection System		km	\$57,213	118.114	\$6,757,708	118.606	\$6,785,857
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	118.114	\$43,515,544	118.606	\$43,696,807
2	Traction Power Distribution		km	\$686,995	118.114	\$81,143,691	118.606	\$81,481,693
<b>Vehicle Costs</b>								
1	Fleet Size Estimate					\$0		\$0
<b>Support Facility Costs</b>								
1	Facility Cost Breakdown							
<b>Program Implementation Costs</b>								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$334,446,478		\$334,028,392
<b>Contingencies</b>								
1	Contingencies			25% of Total Construction Cost		\$327,888,704		\$327,478,816
<b>Total Construction</b>						\$1,098,785,790		\$1,102,943,437
<b>Total Construction and Right of Way</b>						\$1,311,554,817		\$1,309,915,263
<b>Grand Total</b>						\$1,973,890,000		\$1,971,422,471

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
Alignment Cost					UPRR:to Truxtun (Amtrak) Station (Alignment F15)	UPRR:to Truxtun (Amtrak) Station (Alignment F16)	
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total	km		135.661			122.196
2	Double Track Section - At-Grade	km	\$846,282	115.949	\$98,125,903		\$87,323,112
3	Double Track Section - On Structure	km	\$1,600,459	19.712	\$31,547,613		\$30,427,291
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0		\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0		\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0		\$0
6	Freight Double Track	km	\$846,282				
7	Freight Single Track	km	\$423,141				
9	Four-track construction or reconstruction	km	\$1,692,564				
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	342.369	\$3,524,376	308.579	\$3,176,543
2	Total Cut	m3	\$7.59	855,922.6	\$6,492,271	771,448.6	\$5,851,526
3	Total Fill	m3	\$7.59	855,922.6	\$6,492,271	771,448.6	\$5,851,526
6	Landscape/Erosion Control	Hectares	\$6,881	3.840	\$26,422	3.200	\$22,019
7	Security Fencing (Both Sides of R/W)	km	\$86,687	115.949	\$10,051,309	103.184	\$8,944,749
8	Special Drainage Facilities		5% of Earthwork Cost		\$1,329,332		\$1,192,318
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	23.650	\$276,770,008	22.950	\$268,578,084
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.245	\$6,028,470	0.245	\$6,028,470
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.560	\$11,032,000	0.560	\$11,032,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	13.550	\$50,801,849	11.750	\$44,053,264
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	17	\$93,947,066	17	\$93,947,066
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	28	\$26,092,795	28	\$26,092,795
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	1	\$15,278,589	1	\$15,278,589
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	9	\$52,662,369	4	\$23,405,498
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702	1	\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1		1	
	Bakersfield Airport Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station	ea	\$32,211,500	0	\$0	0	\$0
	Truxtun (Union Avenue) Intermediate Station	ea	\$32,430,000	0	\$0	0	\$0
	Truxtun (Amtrak) Intermediate Station	ea	\$165,048,000	1	\$165,048,000	1	\$165,048,000
2	Terminal Passenger Stations	ea	N/A	0		0	
3	Parking - Structure	space	\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	5.600	\$6,068,092	3.200	\$3,467,481
2	Single Track Relocation (Permanent)	km	\$1,083,588	24.323	\$26,355,565	20.448	\$22,156,663
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	14.510	\$8,411,730	10.510	\$6,092,852
6	Major Utility Relocations - Dense Suburban	km	\$406,345	10.300	\$4,185,358	10.300	\$4,185,358
7	Major Utility Relocations - Suburban	km	\$232,971	29.150	\$6,791,116	23.650	\$5,509,773
8	Major Utility Relocations - Undeveloped	km	\$11,919	87.201	\$1,039,389	83.236	\$992,129
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	31.570	\$73,645,180	25.490	\$59,462,189
	Dense Suburban	hectare	\$1,166,364	18.392	\$21,451,774	18.392	\$21,451,774
	Suburban	hectare	\$408,227	81.510	\$33,274,619	64.790	\$26,449,056
	Undeveloped	hectare	\$291,591	245.027	\$71,447,688	232.973	\$67,932,966
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare	\$2,332,729	1.300	\$3,032,547	1.300	\$3,032,547
	Dense Suburban	hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation		3% of Line Cost		\$39,357,799		\$35,795,168
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	135.661	\$97,755,406	122.196	\$88,052,717
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	135.661	\$80,850,336	122.196	\$72,825,555
3	Wayside Protection System	km	\$57,213	135.661	\$7,761,632	122.196	\$6,991,253
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	135.661	\$49,980,208	122.196	\$45,019,434
2	Traction Power Distribution	km	\$686,995	135.661	\$93,198,387	122.196	\$83,948,004
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs		25.5% of Total Cost and Procurement		\$396,304,742		\$358,860,473
<b>Contingencies</b>							
1	Contingencies		25% of Total Construction Cost		\$388,534,061		\$351,823,994
<b>Total Construction</b>					\$1,311,926,635		<b>1,193,172,274</b>
<b>Total Construction and Right of Way</b>					\$1,554,136,242		<b>1,407,295,974</b>
<b>Grand Total</b>					\$2,338,975,045		<b>2,117,980,441</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR (around Tulare): to Truxtun (Amtrak) Station (Alignment F17)		UPRR (around Tulare): to Truxtun (Amtrak) Station (Alignment F18)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			136.153		122.688	
2	Double Track Section - At-Grade	km		\$846,282	119.626	\$101,237,682	106.861	\$90,434,891
3	Double Track Section - On Structure	km		\$1,600,459	16.527	\$26,450,150	15.827	\$25,329,828
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282				
7	Freight Single Track	km		\$423,141				
9	Four-track construction or reconstruction	km		\$1,692,564				
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	342.281	\$3,523,468	308.491	\$3,175,635
2	Total Cut	m3		\$7.59	855,702.2	\$6,490,600	771,228.2	\$5,849,855
3	Total Fill	m3		\$7.59	855,702.2	\$6,490,600	771,228.2	\$5,849,855
6	Landscape/Erosion Control	Hectares		\$6,881	4.160	\$28,624	3.520	\$24,220
7	Security Fencing (Both Sides of R/W)	km		\$86,687	119.626	\$10,370,057	106.861	\$9,263,497
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,345,167		\$1,208,153
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	20.450	\$239,321,212	19.750	\$231,129,288
2	High Structure	km		\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km		\$24,606,000	0.245	\$6,028,470	0.245	\$6,028,470
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.580	\$11,426,000	0.580	\$11,426,000
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379		\$0		\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567				
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	15.450	\$57,925,356	13.650	\$51,176,770
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	26	\$143,683,749	26	\$143,683,749
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	34	\$31,684,109	34	\$31,684,109
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	9	\$52,662,369	4	\$23,405,498
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	1	\$151,702	1	\$151,702
Building Items								
1	Intermediate Passenger Stations	ea		N/A	1		1	
	Bakersfield Airport Intermediate Station	ea		\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station	ea		\$32,211,500	0	\$0	0	\$0
	Truxtun (Union Avenue) Intermediate Station	ea		\$32,430,000	0	\$0	0	\$0
	Truxtun (Amtrak) Intermediate Station	ea		\$165,048,000	1	\$165,048,000	1	\$165,048,000
2	Terminal Passenger Stations	ea		N/A	0		0	
3	Parking - Structure	space		\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	5.200	\$5,634,657	2.800	\$3,034,046
2	Single Track Relocation (Permanent)	km		\$1,083,588	20.073	\$21,750,317	16.198	\$17,551,414
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km		\$579,719	14.510	\$8,411,730	10.510	\$6,092,852
6	Major Utility Relocations - Dense Suburban	km		\$406,345	6.900	\$2,803,784	6.900	\$2,803,784
7	Major Utility Relocations - Suburban	km		\$232,971	33.092	\$7,709,489	27.592	\$6,428,147
8	Major Utility Relocations - Undeveloped	km		\$11,919	87.151	\$1,038,793	83.186	\$991,533
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	31.570	\$73,645,180	25.490	\$59,462,189
	Dense Suburban	hectare		\$1,166,364	13.224	\$15,424,002	13.224	\$15,424,002
	Suburban	hectare		\$408,227	81.878	\$33,424,782	65.158	\$26,599,219
	Undeveloped	hectare		\$291,591	244.875	\$71,403,366	232.821	\$67,888,644
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	1.300	\$3,032,547	1.300	\$3,032,547
	Dense Suburban	hectare		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare		\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation			3% of Line Cost		\$39,482,528		\$35,919,898
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	136.153	\$98,109,935	122.688	\$88,407,245
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	136.153	\$81,143,555	122.688	\$73,118,774
3	Wayside Protection System	km		\$57,213	136.153	\$7,789,781	122.688	\$7,019,402
Electrification Items								
1	Traction Power Supply	km		\$368,420	136.153	\$50,161,470	122.688	\$45,200,697
2	Traction Power Distribution	km		\$686,995	136.153	\$93,536,389	122.688	\$84,286,005
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Facility Cost Breakdown							
Program Implementation Costs								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$395,886,656		\$358,442,387
Contingencies								
1	Contingencies			25% of Total Construction Cost		\$388,124,172		\$351,414,105
Total Construction						1,316,084,283	1,197,329,921	
Total Construction and Right of Way						1,552,496,688	1,405,656,420	
Grand Total						2,336,507,516	2,115,512,913	

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES		
<b>Alignment Cost</b>					<b>UPRR: to Truxtun (Amtrak) Station (Alignment F19)</b>		<b>UPRR: to Truxtun (Amtrak) Station (Alignment F20)</b>
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>
							<b>Item Cost</b>
1	Double Track Section - Total	km		144.409			130.944
2	Double Track Section - At-Grade	km	\$846,282	123.455	\$104,477,758		\$93,674,967
3	Double Track Section - On Structure	km	\$1,600,459	20.954	\$33,536,023		\$32,415,702
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0		\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0		\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0		\$0
6	Freight Double Track	km	\$846,282				
7	Freight Single Track	km	\$423,141				
9	Four-track construction or reconstruction	km	\$1,692,564				
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	343.274	\$3,533,687		\$3,185,854
2	Total Cut	m3	\$7.59	858,184.0	\$6,509,424		\$5,868,679
3	Total Fill	m3	\$7.59	858,184.0	\$6,509,424		\$5,868,679
6	Landscape/Erosion Control	Hectares	\$6,881	5.120	\$35,230		\$30,826
7	Security Fencing (Both Sides of R/W)	km	\$86,687	123.455	\$10,701,947		\$9,595,387
8	Special Drainage Facilities	5% of Earthwork Cost			\$1,364,486		\$1,227,471
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	20.484	\$239,719,105		\$231,527,181
2	High Structure	km	\$14,043,299	0.000	\$0		\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0		\$0
	Waterway Crossing - Primary	km	\$24,606,000	0.340	\$8,366,040		\$8,366,040
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.610	\$12,017,000		\$12,017,000
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379		\$0		\$0
13	Trench Short	km	\$42,322,835	0.000	\$0		\$0
14	Trench Long	km	\$33,464,567				
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0		\$0
16	Retaining Walls	km	\$3,749,214	19.100	\$71,609,986		\$64,861,401
17	Containment Walls	km	\$1,278,634	0.000	\$0		\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0		\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	7	\$102,399,052		\$87,770,616
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	18	\$99,473,364		\$99,473,364
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	16	\$14,910,169		\$14,910,169
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943		\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	8	\$46,810,995		\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	5	\$4,930,325		\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0		\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702		\$151,702
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea	N/A	1			1
	Bakersfield Airport Intermediate Station	ea	\$32,430,000	0	\$0		\$0
	Bakersfield Golden State Intermediate Station	ea	\$32,211,500	0	\$0		\$0
	Truxtun (Union Avenue) Intermediate Station	ea	\$32,430,000	0	\$0		\$0
	Truxtun (Amtrak) Intermediate Station	ea	\$165,048,000	1	\$165,048,000		\$165,048,000
2	Terminal Passenger Stations	ea	N/A	0			0
3	Parking - Structure	space	\$14,244	750	\$10,683,000		\$10,683,000
4	Parking - At Grade	space	\$2,042	0	\$0		\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	6.000	\$6,501,527		\$3,900,916
2	Single Track Relocation (Permanent)	km	\$1,083,588	34.886	\$37,802,046		\$33,603,143
3	Single Track Removal	km	\$54,000	0.000	\$0		\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0		\$0
5	Major Utility Relocations - Urban	km	\$579,719	19.360	\$11,223,369		\$8,904,491
6	Major Utility Relocations - Dense Suburban	km	\$406,345	14.384	\$5,844,873		\$5,844,873
7	Major Utility Relocations - Suburban	km	\$232,971	36.400	\$8,480,158		\$7,198,816
8	Major Utility Relocations - Undeveloped	km	\$11,919	74.265	\$885,199		\$837,938
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	hectare	\$3,499,093	0.000	\$0		\$0
	Urban	hectare	\$2,332,729	29.424	\$68,638,584		\$54,455,593
	Dense Suburban	hectare	\$1,166,364	23.688	\$27,628,466		\$27,628,466
	Suburban	hectare	\$408,227	99.408	\$40,581,074		\$33,755,511
	Undeveloped	hectare	\$291,591	221.890	\$64,701,018		\$61,186,296
2	Right-of-Way Required for Passenger Sta & Parking Facilities						
	Dense Urban	hectare	\$3,499,093	0.000	\$0		\$0
	Urban	hectare	\$2,332,729	1.320	\$3,079,202		\$3,079,202
	Dense Suburban	hectare	\$1,166,364	0.000	\$0		\$0
	Suburban	hectare	\$408,227	0.000	\$0		\$0
	Undeveloped	hectare	\$291,591	0.000	\$0		\$0
<b>Environmental Impact Mitigation</b>							
1	Environmental Mitigation	3% of Line Cost			\$43,221,400		\$39,658,769
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	144.409	\$104,059,092		\$94,356,403
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	144.409	\$86,063,911		\$78,039,130
3	Wayside Protection System	km	\$57,213	144.409	\$8,262,135		\$7,491,756
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	144.409	\$53,203,145		\$48,242,371
2	Traction Power Distribution	km	\$686,995	144.409	\$99,208,217		\$89,957,833
<b>Vehicle Costs</b>							
1	Fleet Size Estimate				\$0		\$0
<b>Support Facility Costs</b>							
1	Facility Cost Breakdown						
<b>Program Implementation Costs</b>							
1	Program Implementation Costs	25.5% of Total Cost and Procurement			\$430,583,585		\$393,139,316
<b>Contingencies</b>							
1	Contingencies	25% of Total Construction Cost			\$422,140,769		\$385,430,702
<b>Total Construction</b>					<b>1,440,713,334</b>		<b>1,321,958,972</b>
<b>Total Construction and Right of Way</b>					<b>1,688,563,078</b>		<b>1,541,722,810</b>
<b>Grand Total</b>					<b>2,541,287,432</b>		<b>2,320,292,828</b>

**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					UPRR (around Tulare): to Truxtun (Amtrak) Station (Alignment F21)		UPRR (around Tulare): to Truxtun (Amtrak) Station (Alignment F22)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			144.901		131.436	
2	Double Track Section - At-Grade	km		\$846,282	127.132	\$107,589,537	114.367	\$96,786,746
3	Double Track Section - On Structure	km		\$1,600,459	17.769	\$28,438,560	17.069	\$27,318,239
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282				
7	Freight Single Track	km		\$423,141				
9	Four-track construction or reconstruction	km		\$1,692,564				
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	343.185	\$3,532,780	309.396	\$3,184,947
2	Total Cut	m3		\$7.59	857,963.6	\$6,507,753	773,489.6	\$5,867,008
3	Total Fill	m3		\$7.59	857,963.6	\$6,507,753	773,489.6	\$5,867,008
6	Landscape/Erosion Control	Hectares		\$6,881	5.440	\$37,431	4.800	\$33,028
7	Security Fencing (Both Sides of R/W)	km		\$86,687	127.132	\$11,020,695	114.367	\$9,914,135
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,380,321		\$1,243,306
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	17.284	\$202,270,309	16.584	\$194,078,385
2	High Structure	km		\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary	km		\$24,606,000	0.340	\$8,366,040	0.340	\$8,366,040
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.630	\$12,411,000	0.630	\$12,411,000
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379		\$0		\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567				
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	21.000	\$78,733,493	19.200	\$71,984,908
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	7	\$102,399,052	6	\$87,770,616
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	27	\$149,210,047	27	\$149,210,047
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	22	\$20,501,482	22	\$20,501,482
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	4	\$61,114,355	4	\$61,114,355
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	8	\$46,810,995	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	5	\$4,930,325	3	\$2,958,195
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	1	\$151,702	1	\$151,702
Building Items								
1	Intermediate Passenger Stations	ea		N/A	1		1	
	Bakersfield Airport Intermediate Station	ea		\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station	ea		\$32,211,500	0	\$0	0	\$0
	Truxtun (Union Avenue) Intermediate Station	ea		\$32,430,000	0	\$0	0	\$0
	Truxtun (Amtrak) Intermediate Station	ea		\$165,048,000	1	\$165,048,000	1	\$165,048,000
2	Terminal Passenger Stations	ea		N/A	0		0	
3	Parking - Structure	space		\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	5.600	\$6,068,092	3.200	\$3,467,481
2	Single Track Relocation (Permanent)	km		\$1,083,588	30.636	\$33,196,797	26.761	\$28,997,894
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km		\$579,719	19.360	\$11,223,369	15.360	\$8,904,491
6	Major Utility Relocations - Dense Suburban	km		\$406,345	10.984	\$4,463,298	10.984	\$4,463,298
7	Major Utility Relocations - Suburban	km		\$232,971	40.342	\$9,398,532	34.842	\$8,117,189
8	Major Utility Relocations - Undeveloped	km		\$11,919	74.215	\$884,603	70.250	\$837,343
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	29.424	\$68,638,584	23.344	\$54,455,593
	Dense Suburban	hectare		\$1,166,364	18.520	\$21,600,695	18.520	\$21,600,695
	Suburban	hectare		\$408,227	99.776	\$40,731,236	83.056	\$33,905,674
	Undeveloped	hectare		\$291,591	221.738	\$64,656,696	209.684	\$61,141,974
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban	hectare		\$3,499,093	0.000	\$0	0.000	\$0
	Urban	hectare		\$2,332,729	1.320	\$3,079,202	1.320	\$3,079,202
	Dense Suburban	hectare		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	hectare		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	hectare		\$291,591	0.000	\$0	0.000	\$0
Environmental Impact Mitigation								
1	Environmental Mitigation			3% of Line Cost		\$43,346,129		\$39,783,499
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	144.901	\$104,413,620	131.436	\$94,710,931
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	144.901	\$86,357,129	131.436	\$78,332,349
3	Wayside Protection System	km		\$57,213	144.901	\$8,290,284	131.436	\$7,519,905
Electrification Items								
1	Traction Power Supply	km		\$368,420	144.901	\$53,384,407	131.436	\$48,423,634
2	Traction Power Distribution	km		\$686,995	144.901	\$99,546,218	131.436	\$90,295,835
Vehicle Costs								
1	Fleet Size Estimate					\$0		\$0
Support Facility Costs								
1	Facility Cost Breakdown							
Program Implementation Costs								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$430,165,499		\$392,721,230
Contingencies								
1	Contingencies			25% of Total Construction Cost		\$421,730,881		\$385,020,814
Total Construction						1,444,870,981	1,326,116,619	
Total Construction and Right of Way						1,686,923,524	1,540,083,256	
Grand Total						2,538,819,903	2,317,825,300	



**Capital Cost Estimates**  
**CAHSRA Program EIR/EIS**  
**SACRAMENTO TO BAKERSFIELD**  
**Corridor F: Tulare to Bakersfield**

Cost Elements			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					BNSF: to Truxtun (Amtrak) Station (Alignment F23)		BNSF: to Truxtun (Amtrak) Station (Alignment F24)	
<b>Track</b>					<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total		km		143.941		130.476	
2	Double Track Section - At-Grade		km	\$846,282	130.755	\$110,655,448	117.990	\$99,852,657
3	Double Track Section - On Structure		km	\$1,600,459	13.186	\$21,103,976	12.486	\$19,983,654
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282				
7	Freight Single Track		km	\$423,141				
9	Four-track construction or reconstruction		km	\$1,692,564				
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	337.748	\$3,476,809	303.959	\$3,128,976
2	Total Cut		m3	\$7.59	844,370.6	\$6,404,648	759,896.6	\$5,763,903
3	Total Fill		m3	\$7.59	844,370.6	\$6,404,648	759,896.6	\$5,763,903
6	Landscape/Erosion Control		Hectares	\$6,881	3.520	\$24,220	2.880	\$19,817
7	Security Fencing (Both Sides of R/W)		km	\$86,687	130.755	\$11,334,745	117.990	\$10,228,185
8	Special Drainage Facilities			5% of Earthwork Cost		\$1,382,254		\$1,245,239
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	16.700	\$195,435,904	16.000	\$187,243,980
2	High Structure		km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	0.000	\$0
	Waterway Crossing - Primary		km	\$24,606,000	0.100	\$2,460,600	0.100	\$2,460,600
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0.510	\$10,047,000	0.510	\$10,047,000
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589		\$0		\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast		km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844		\$0		\$0
11	Crossovers		ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379		\$0		\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long		km	\$33,464,567				
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls		km	\$3,749,214	12.400	\$46,490,253	10.600	\$39,741,668
17	Containment Walls		km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	4	\$58,513,744	3	\$43,885,308
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	13	\$71,841,874	13	\$71,841,874
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	47	\$43,798,621	47	\$43,798,621
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	7	\$40,959,621	2	\$11,702,749
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	7	\$6,902,455	5	\$4,930,325
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	1	\$151,702	1	\$151,702
<b>Building Items</b>								
1	Intermediate Passenger Stations		ea	N/A	1		1	
	Bakersfield Airport Intermediate Station		ea	\$32,430,000	0	\$0	0	\$0
	Bakersfield Golden State Intermediate Station		ea	\$32,211,500	0	\$0	0	\$0
	Truxtun (Union Avenue) Intermediate Station		ea	\$32,430,000	0	\$0	0	\$0
	Truxtun (Amtrak) Intermediate Station		ea	\$165,048,000	1	\$165,048,000	1	\$165,048,000
2	Terminal Passenger Stations		ea	N/A	0		0	
3	Parking - Structure		space	\$14,244	750	\$10,683,000	750	\$10,683,000
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	4.400	\$4,767,787	2.000	\$2,167,176
2	Single Track Relocation (Permanent)		km	\$1,083,588	21.635	\$23,443,423	17.760	\$19,244,520
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	14.510	\$8,411,730	10.510	\$6,092,852
6	Major Utility Relocations - Dense Suburban		km	\$406,345	7.550	\$3,067,908	7.550	\$3,067,908
7	Major Utility Relocations - Suburban		km	\$232,971	16.774	\$3,907,862	11.274	\$2,626,519
8	Major Utility Relocations - Undeveloped		km	\$11,919	105.107	\$1,252,819	101.142	\$1,205,559
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	31.570	\$73,645,180	25.490	\$59,462,189
	Dense Suburban		hectare	\$1,166,364	12.388	\$14,448,922	12.388	\$14,448,922
	Suburban		hectare	\$408,227	46.471	\$18,970,721	29.751	\$12,145,158
	Undeveloped		hectare	\$291,591	268.833	\$78,389,374	256.780	\$74,874,652
2	Right-of-Way Required for Passenger Sta & Parking Facilities							
	Dense Urban		hectare	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		hectare	\$2,332,729	1.300	\$3,032,547	1.300	\$3,032,547
	Dense Suburban		hectare	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		hectare	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		hectare	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Impact Mitigation</b>								
1	Environmental Mitigation			3% of Line Cost		\$36,228,921		\$32,666,290
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	143.941	\$103,721,858	130.476	\$94,019,168
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	143.941	\$85,784,995	130.476	\$77,760,214
3	Wayside Protection System		km	\$57,213	143.941	\$8,235,360	130.476	\$7,464,981
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	143.941	\$53,030,724	130.476	\$48,069,951
2	Traction Power Distribution		km	\$686,995	143.941	\$98,886,703	130.476	\$89,636,320
<b>Vehicle Costs</b>								
1	Fleet Size Estimate					\$0		\$0
<b>Support Facility Costs</b>								
1	Facility Cost Breakdown							
<b>Program Implementation Costs</b>								
1	Program Implementation Costs			25.5% of Total Cost and Procurement		\$365,248,321		\$327,804,052
<b>Contingencies</b>								
1	Contingencies			25% of Total Construction Cost		\$358,086,589		\$321,376,522
<b>Total Construction</b>						<b>1,207,630,690</b>		<b>\$1,088,876,329</b>
<b>Total Construction and Right of Way</b>						<b>1,432,346,355</b>		<b>\$1,285,506,087</b>
<b>Grand Total</b>						<b>2,155,681,265</b>		<b>\$1,934,686,662</b>

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES							
AREA 1: Bakersfield Connection					Wheeler Ridge Corridor (Option 1.01)		Union Avenue Corridor (Option 1.02)					
Track					Quantities		Item Cost		Quantities		Item Cost	
	1	Double Track Section - Total	km			46.000				47.200		
	2	Double Track Section - At-Grade	km	\$846,282		44.300	\$37,490,297			40.450	\$34,232,111	
	3	Double Track Section - On Structure	km	\$1,600,459		1.700	\$2,720,781			6.750	\$10,803,100	
	4	Double Track Section - In Tunnel or Subway	km	\$1,600,459		0.000	\$0			0.000	\$0	
	5	Double Track Section - In Trench	km	\$1,600,459		0.000	\$0			0.000	\$0	
		Single Track Sections - In Tunnel or Subway	km	\$1,000,287		0.000	\$0			0.000	\$0	
	6	Freight Double Track	km	\$846,282		0.000	\$0			0.000	\$0	
	7	Freight Single Track	km	\$423,141		0.000	\$0			0.000	\$0	
	9	Four-track construction or reconstruction	km	\$1,692,564		0.000	\$0			0.000	\$0	
Earthwork and Related Items												
	1	Site Preparation - Undeveloped	Hectares	\$10,294		130.658	\$1,345,004			125.916	\$1,296,190	
	2	Total Cut	m3	\$7.59		320,200.0	\$2,428,754			289,150.0	\$2,193,236	
	3	Total Fill	m3	\$7.59		320,200.0	\$2,428,754			289,150.0	\$2,193,236	
	6	Landscape/Erosion Control	Hectares	\$6,881		11.340	\$78,028			9.400	\$64,679	
	7	Security Fencing (Both Sides of R/W)	km	\$86,687		44.286	\$3,839,022			40.444	\$3,505,970	
	8	Special Drainage Facilities	5% of Earthwork Cost				\$505,978				\$462,666	
Structures/Tunnels/Walls												
	1	Standard Structure	km	\$11,702,749		1.700	\$19,894,673			0.000	\$0	
	2	High Structure	km	\$14,043,299		0.000	\$0			6.750	\$94,792,265	
	3	Long Span Structure	km	\$32,020,021		0.000	\$0			0.000	\$0	
	4	Waterway Crossing - Primary	km	\$24,606,000		0.000	\$0			0.000	\$0	
		Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000		0.026	\$512,200			0.039	\$768,300	
	5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		0.000	\$0			0.000	\$0	
	6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589		0.000	\$0			0.000	\$0	
	7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		0.000	\$0			0.000	\$0	
	8	Double Track Drill & Blast	km	\$71,355,733		0.000	\$0			0.000	\$0	
	9	Double Track Mined (Soft Soil)	km	\$82,012,758		0.000	\$0			0.000	\$0	
	10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		0.000	\$0			0.000	\$0	
	11	Crossovers	ea	\$80,782,844		0.000	\$0			0.000	\$0	
	12	Cut & Cover Double Track Tunnel	km	\$41,006,379		0.000	\$0			0.000	\$0	
	13	Trench Short	km	\$42,322,835		0.000	\$0			0.000	\$0	
	14	Trench Long	km	\$33,464,567		0.000	\$0			0.000	\$0	
	15	Mechanical & Electrical for Tunnels	km	\$1,645,723		0.000	\$0			0.000	\$0	
	16	Retaining Walls	km	\$3,749,214		3.000	\$11,247,642			3.200	\$11,997,485	
	17	Containment Walls	km	\$1,278,634		0.000	\$0			0.000	\$0	
	18	Single Track Cut and Cover Subway	km	\$25,628,987		0.000	\$0			0.000	\$0	
Grade Separations												
	1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436		0	\$0			2	\$29,256,872	
	2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298		7	\$38,684,086			5	\$27,631,490	
	3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886		21	\$19,569,597			15	\$13,978,283	
	7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589		0	\$0			3	\$45,835,766	
	8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374		0	\$0			0	\$0	
	9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065		0	\$0			1	\$986,065	
	10	Street Bridging HSR Trench	ea	\$1,500,000		0	\$0			0	\$0	
	21	Minor crossing closures	ea	\$151,702		11	\$1,668,725			6	\$910,214	
Building Items												
	1	Intermediate Passenger Stations	ea			0	\$0			0	\$0	
	2	Terminal Passenger Stations	ea			0	\$0			0	\$0	
	3	Parking - Structure	space	\$14,244		0	\$0			0	\$0	
	4	Parking - At Grade	space	\$2,042		0	\$0			0	\$0	
Rail and Utility Relocation												
	1	Single Track Relocation (Temporary)	km	\$1,083,588		0.000	\$0			0.000	\$0	
	2	Single Track Relocation (Permanent)	km	\$1,083,588		0.000	\$0			0.000	\$0	
	3	Single Track Removal	km	\$54,000		0.000	\$0			0.000	\$0	
	4	Major Utility Relocations - Dense Urban	km	\$758,511		0.000	\$0			0.000	\$0	
	5	Major Utility Relocations - Urban	km	\$579,719		3.100	\$1,797,130			8.600	\$4,985,588	
	6	Major Utility Relocations - Dense Suburban	km	\$406,345		0.000	\$0			3.000	\$1,219,036	
	7	Major Utility Relocations - Suburban	km	\$232,971		10.300	\$2,399,605			3.500	\$815,400	
	8	Major Utility Relocations - Undeveloped	km	\$11,919		29.800	\$355,200			32.200	\$383,807	
Right-of-Way												
	1	Right-of-Way Required for Each Segment										
		Dense Urban	Hectares	\$3,499,093		0.000	\$0			0.000	\$0	
		Urban	Hectares	\$2,332,729		0.000	\$0			13.200	\$30,792,019	
		Dense Suburban	Hectares	\$1,166,364		13.700	\$15,979,192			4.600	\$5,365,276	
		Suburban	Hectares	\$408,227		31.300	\$12,777,519			10.700	\$4,368,034	
		Undeveloped	Hectares	\$291,591		90.400	\$26,359,829			97.800	\$28,517,603	
	2	Right-of-Way Required for Passenger Station & Parking Facilities										
		Dense Urban	Hectares	\$3,499,093		0.000	\$0			0.000	\$0	
		Urban	Hectares	\$2,332,729		0.000	\$0			0.000	\$0	
		Dense Suburban	Hectares	\$1,166,364		0.000	\$0			0.000	\$0	
		Suburban	Hectares	\$408,227		0.000	\$0			0.000	\$0	
		Undeveloped	Hectares	\$291,591		0.000	\$0			0.000	\$0	
Environmental Impact Mitigation												
	Environmental Mitigation			3% of Line Cost			\$7,761,243				\$12,089,082	
Signals and Communication												
	1	Signaling (ATC)	km	\$720,586		46.000	\$33,146,952			47.200	\$34,011,655	
	2	Communications (w/Fiber Optic Backbone)	km	\$595,973		46.000	\$27,414,773			47.200	\$28,129,941	
	3	Wayside Protection System	km	\$57,213		46.000	\$2,631,818			47.200	\$2,700,474	
Electrification Items												
	1	Traction Power Supply	km	\$368,420		46.000	\$16,947,314			47.200	\$17,389,418	
	2	Traction Power Distribution	km	\$686,995		46.000	\$31,601,756			47.200	\$32,426,150	
Vehicle Costs												
	1	Fleet size estimate	vehicles									
Support Facility Costs												
	1	Facility cost breakdown	ea									
Program Implementation Costs												
	Program Implementation Costs			25.5% of Total Cost and Procurement			\$82,004,398				\$123,445,860	
Contingencies												
	Contingencies			25% of Total Construction Cost			\$80,396,468				\$121,025,353	
Total Construction							\$258,708,090			\$402,969,396		
Total Construction and Right of Way							\$321,585,873			\$484,101,410		
Grand Total							\$483,986,739			\$728,572,622		

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSR PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>AREA 1: Bakersfield Connection</b>				<b>SR-58 Corridor (Option 1.03)</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		14.200	
2	Double Track Section - At-Grade	km	\$846,282	14.200	\$12,017,206
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	29.011	\$298,642
2	Total Cut	m3	\$7.59	72,550.0	\$550,300
3	Total Fill	m3	\$7.59	72,550.0	\$550,300
6	Landscape/Erosion Control	Hectares	\$6,881	18.430	\$126,813
7	Security Fencing (Both Sides of R/W)	km	\$86,687	14.185	\$1,229,655
8	Special Drainage Facilities	5% of Earthwork Cost			\$137,786
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	0.000	\$0
2	High Structure	km	\$14,043,299	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.016	\$315,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0
11	Crossovers	ea	\$80,782,844	0.000	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	18.600	\$69,735,380
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	4	\$3,727,542
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea		0	\$0
2	Terminal Passenger Stations	ea		0	\$0
3	Parking - Structure	space	\$14,244	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	14.200	\$169,256
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	29.100	\$8,485,299
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
<b>Environmental Impact Mitigation</b>					
Environmental Mitigation		3% of Line Cost			\$3,700,576
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	14.200	\$10,232,320
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	14.200	\$8,462,821
3	Wayside Protection System	km	\$57,213	14.200	\$812,431
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	14.200	\$5,231,562
2	Traction Power Distribution	km	\$686,995	14.200	\$9,755,325
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			
<b>Program Implementation Costs</b>					
Program Implementation Costs		25.5% of Total Cost and Procurement			\$34,562,296
<b>Contingencies</b>					
Contingencies		25% of Total Construction Cost			\$33,884,603
<b>Total Construction</b>					<b>\$123,352,539</b>
<b>Total Construction and Right of Way</b>					<b>\$135,538,414</b>
<b>Grand Total</b>					<b>\$203,985,313</b>

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITY	
AREA 2 - Rosamond to Palmdale (Includes Palmdale Station)				Antelope Valley Corridor (Option 2.01)	
Track				Quantities	Item Cost
1	Double Track Section - Total	km		33.610	
2	Double Track Section - At-Grade	km	\$846,282	33.610	\$28,443,542
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
Earthwork and Related Items					
1	Site Preparation - Undeveloped	Hectares	\$10,294	102.144	\$1,051,479
2	Total Cut	m3	\$7.59	255,350.0	\$1,936,859
3	Total Fill	m3	\$7.59	255,350.0	\$1,936,859
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	33.600	\$2,912,684
8	Special Drainage Facilities	5% of Earthwork Cost			\$391,894
Structures/Tunnels/Walls					
1	Standard Structure	km	\$11,702,749	0.000	\$0
2	High Structure	km	\$14,043,299	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0
11	Crossovers	ea	\$80,782,844	0.000	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	0.000	\$0
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
Grade Separations					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	9	\$49,736,682
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	7	\$6,523,199
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	1	\$5,851,374
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
Building Items					
1	Intermediate Passenger Stations			1	
	Palmdale Station	ea	\$32,430,000	1	\$32,430,000
2	Terminal Passenger Stations			0	
3	Parking - Structure	space	\$14,244	0	\$0
4	Parking - At Grade	space	\$2,042	483	\$986,286
Rail and Utility Relocation					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	33.600	\$36,408,552
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	10.700	\$2,492,794
8	Major Utility Relocations - Undeveloped	km	\$11,919	23.000	\$274,148
Right-of-Way					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	32.600	\$13,308,215
	Undeveloped	Hectares	\$291,591	69.900	\$20,382,213
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	2.010	\$7,033,177
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
Environmental Mitigation					
	Environmental Mitigation	3% of Line Cost			\$7,590,640
Signals and Communication					
1	Signaling (ATC)	km	\$720,586	33.610	\$24,218,893
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	33.610	\$20,030,663
3	Wayside Protection System	km	\$57,213	33.610	\$1,922,944
Electrification Items					
1	Traction Power Supply	km	\$368,420	33.610	\$12,382,592
2	Traction Power Distribution	km	\$686,995	33.610	\$23,089,892
Vehicle Costs					
1	Fleet size estimate	vehicles			
Support Facility Costs					
1	Facility cost breakdown	ea			
Program Implementation Costs					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$76,840,573
Contingencies					
	Contingencies	25% of Total Construction Cost			\$75,333,895
Total Construction					\$253,021,335
Total Construction and Right of Way					\$301,335,580
Grand Total					\$453,510,048

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Metrolink/UPRR: Beg Alg to Sylmar Station (Option 3.01)		Metrolink/UPRR: Sylmar Sta to Burbank Airport Sta (Option 3.02)	
<b>AREA 3: San Fernando Valley</b>							
<b>Track Items</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		0.260		10.750	
2	Double Track Section - At-Grade	km	\$846,282	0.260	\$220,033	6.680	\$5,653,164
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0	4.070	\$6,513,869
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.819	\$8,431	34.109	\$351,121
2	Total Cut	m3	\$7.59	2,050.0	\$15,549	1,132,350.0	\$8,589,005
3	Total Fill	m3	\$7.59	2,050.0	\$15,549	26,750.0	\$202,902
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.080	\$550
7	Security Fencing (Both Sides of R/W)	km	\$86,687	0.259	\$22,452	6.680	\$579,069
8	Special Drainage Facilities	5% of Earthwork Cost			\$3,099		\$486,132
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	0.000	\$0	4.070	\$47,630,187
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0	0.016	\$315,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	0.000	\$0	6.700	\$25,119,733
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	4	\$58,513,744
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0	4	\$6,000,000
21	Minor crossing closures	ea	\$151,702	0	\$0	0	\$0
<b>Building Items</b>							
1	Intermediate Passenger Stations	ea		0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	7.570	\$8,202,760
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.260	\$281,733	6.680	\$7,238,367
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.300	\$173,916	10.750	\$6,231,985
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.800	\$1,866,183	32.900	\$76,746,776
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Mitigation</b>							
	Environmental Mitigation	3% of Line Cost			\$41,171		\$6,232,247
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	0.260	\$187,352	10.750	\$7,746,299
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	0.260	\$154,953	10.750	\$6,406,713
3	Wayside Protection System	km	\$57,213	0.260	\$14,875	10.750	\$615,044
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	0.260	\$95,789	10.750	\$3,960,514
2	Traction Power Distribution	km	\$686,995	0.260	\$178,619	10.750	\$7,385,193
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles					
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea					
<b>Program Implementation Costs</b>							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$836,325		\$74,133,747
<b>Contingencies</b>							
	Contingencies	25% of Total Construction Cost			\$819,926		\$72,680,144
<b>Total Construction</b>					<b>\$1,372,352</b>		<b>\$207,741,552</b>
<b>Total Construction and Right of Way</b>					<b>\$3,279,705</b>		<b>\$290,720,575</b>
<b>Grand Total</b>					<b>\$4,935,956</b>		<b>\$437,534,465</b>

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Metrolink/UPRR: Burbank Airport Sta to Burbank DT Sta (Option 3.03)		Metrolink/UPRR: DT Burbank Sta to Exist. LAUS or LAUS S. (Under I-5 & SR-110 Variant) (Option 3.04A)	
AREA 3: San Fernando Valley							
Track Items				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		7.500		18.230	
2	Double Track Section - At-Grade	km	\$846,282	7.500	\$6,347,116	7.200	\$6,093,231
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0	11.030	\$17,653,066
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	24.688	\$254,140	54.416	\$560,163
2	Total Cut	m3	\$7.59	1,760,150.0	\$13,350,940	48,200.0	\$365,603
3	Total Fill	m3	\$7.59	18,150.0	\$137,670	90,000.0	\$682,660
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.160	\$1,101
7	Security Fencing (Both Sides of R/W)	km	\$86,687	7.500	\$650,153	7.200	\$624,147
8	Special Drainage Facilities	5% of Earthwork Cost			\$719,645		\$111,684
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	0.000	\$0	3.220	\$37,682,851
2	High Structure	km	\$14,043,299	0.000	\$0	7.540	\$105,886,471
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.250	\$8,005,005
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0	0.016	\$315,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	10.400	\$38,991,825	2.200	\$8,248,271
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	5	\$73,142,180
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	1	\$15,278,589	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,951,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	3	\$4,500,000	0	\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702	0	\$0
Building Items							
1	Intermediate Passenger Stations	ea		0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	5.200	\$5,634,657	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	7.500	\$8,126,909	9.900	\$10,727,520
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	7.500	\$4,347,896	18.300	\$10,608,867
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	23.000	\$53,652,761	54.000	\$125,967,352
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$3,501,304		\$12,041,551
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	7.500	\$5,404,394	18.230	\$13,136,281
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	7.500	\$4,469,800	18.230	\$10,864,594
3	Wayside Protection System	km	\$57,213	7.500	\$429,101	18.230	\$1,043,001
Electrification Items							
1	Traction Power Supply	km	\$368,420	7.500	\$2,763,149	18.230	\$6,716,294
2	Traction Power Distribution	km	\$686,995	7.500	\$5,152,460	18.230	\$12,523,913
Vehicle Costs							
1	Fleet size estimate	vehicles					
Support Facility Costs							
1	Facility cost breakdown	ea					
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$44,335,374		\$137,545,457
Contingencies							
	Contingencies	25% of Total Construction Cost			\$43,466,053		\$134,848,487
Total Construction					\$116,710,146		\$401,385,044
Total Construction and Right of Way					\$173,864,212		\$539,393,948
Grand Total					\$261,665,639		\$811,787,891



**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Metrolink/UPRR: DT Burbank Sta to LAUS E. Bank (Under I-5 & SR-110 Variant) (Option 3.04B)		Metrolink/UPRR: DT Burbank Sta to Exist. LAUS or LAUS S. (Over I-5 & SR-110 Variant) (Option 3.04C)	
AREA 3: San Fernando Valley							
Track Items				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		16.140		18.270	
2	Double Track Section - At-Grade	km	\$846,282	7.200	\$6,093,231	10.420	\$8,818,260
3	Double Track Section - On Structure	km	\$1,600,459	8.940	\$14,308,106	7.850	\$12,563,605
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	48.071	\$494,847	51.778	\$533,007
2	Total Cut	m3	\$7.59	48,200.0	\$365,603	61,850.0	\$469,139
3	Total Fill	m3	\$7.59	90,000.0	\$682,660	141,650.0	\$1,074,432
6	Landscape/Erosion Control	Hectares	\$6,881	0.160	\$1,101	0.240	\$1,651
7	Security Fencing (Both Sides of R/W)	km	\$86,687	7.200	\$624,147	10.410	\$902,412
8	Special Drainage Facilities	5% of Earthwork Cost			\$108,418		\$149,032
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	2.410	\$28,203,624	3.180	\$37,214,741
2	High Structure	km	\$14,043,299	6.510	\$91,421,873	4.390	\$61,650,080
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.280	\$8,965,606
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.016	\$315,200	0.016	\$315,200
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	2.200	\$8,248,271	4.200	\$15,746,699
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	5	\$73,142,180	5	\$73,142,180
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	5	\$76,392,943
8	Street Undercrossing HSR - (Suburban)	ea	\$5,951,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	0	\$0
Building Items							
1	Intermediate Passenger Stations	ea		0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	9.900	\$10,727,520	12.110	\$13,122,249
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	16.200	\$9,391,456	18.300	\$10,608,867
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	47.600	\$111,037,888	52.800	\$123,168,078
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$10,791,848		\$10,981,541
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	16.140	\$11,630,257	18.270	\$13,165,105
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	16.140	\$9,619,009	18.270	\$10,888,432
3	Wayside Protection System	km	\$57,213	16.140	\$923,425	18.270	\$1,045,290
Electrification Items							
1	Traction Power Supply	km	\$368,420	16.140	\$5,946,297	18.270	\$6,731,031
2	Traction Power Distribution	km	\$686,995	16.140	\$11,088,094	18.270	\$12,551,393
Vehicle Costs							
1	Fleet size estimate	vehicles					
Support Facility Costs							
1	Facility cost breakdown	ea					
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$122,797,289		\$127,551,248
Contingencies							
	Contingencies	25% of Total Construction Cost			\$120,389,499		\$125,050,243
Total Construction					\$359,728,261		\$366,051,353
Total Construction and Right of Way					\$481,557,997		\$500,200,972
Grand Total					\$724,744,786		\$752,802,463

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
				Metrolink/UPRR: DT Burbank Sta to LAUS E. Bank (Over I-5 & SR-110 Variant) (Option 3.04D)		I-5: DT Burbank Sta to Exist. LAUS or LAUS S. (Aerial at Silver Lake) (Option 3.04E)	
AREA 3: San Fernando Valley							
Track Items				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		16.180		17.340	
2	Double Track Section - At-Grade	km	\$846,282	9.370	\$7,929,663	1.100	\$930,910
3	Double Track Section - On Structure	km	\$1,600,459	6.810	\$10,899,127	13.840	\$22,150,356
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	2.400	\$3,841,102
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	45.428	\$467,640	53.288	\$548,551
2	Total Cut	m3	\$7.59	53,900.0	\$408,838	0.0	\$0
3	Total Fill	m3	\$7.59	133,700.0	\$1,014,130	41,800.0	\$317,058
6	Landscape/Erosion Control	Hectares	\$6,881	0.240	\$1,651	0.100	\$688
7	Security Fencing (Both Sides of R/W)	km	\$86,687	9.361	\$811,477	1.100	\$95,356
8	Special Drainage Facilities	5% of Earthwork Cost			\$135,187		\$48,083
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	2.410	\$28,203,624	5.980	\$69,982,438
2	High Structure	km	\$14,043,299	4.390	\$61,650,080	7.190	\$100,971,316
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.650	\$20,813,014
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.016	\$315,200	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	2.400	\$113,427,814
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	2.400	\$3,949,734
16	Retaining Walls	km	\$3,749,214	4.200	\$15,746,699	2.200	\$8,248,271
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	5	\$73,142,180	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	5	\$76,392,943	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	0	\$0
Building Items							
1	Intermediate Passenger Stations	ea		0	\$0	0	\$0
2	Terminal Passenger Stations	ea		0	\$0	0	\$0
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	11.060	\$11,984,482	1.560	\$1,690,397
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	16.200	\$9,391,456	17.400	\$10,087,119
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	46.400	\$108,238,614	51.300	\$119,668,985
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation							
	Environmental Mitigation	3% of Line Cost			\$10,133,959		\$11,976,729
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	16.180	\$11,659,080	17.340	\$12,494,960
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	16.180	\$9,642,848	17.340	\$10,334,177
3	Wayside Protection System	km	\$57,213	16.180	\$925,713	17.340	\$992,081
Electrification Items							
1	Traction Power Supply	km	\$368,420	16.180	\$5,961,033	17.340	\$6,388,401
2	Traction Power Distribution	km	\$686,995	16.180	\$11,115,574	17.340	\$11,912,488
Vehicle Costs							
1	Fleet size estimate	vehicles					
Support Facility Costs							
1	Facility cost breakdown	ea					
Program Implementation Costs							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$116,323,656		\$135,371,857
Contingencies							
	Contingencies	25% of Total Construction Cost			\$114,042,800		\$132,717,507
Total Construction					\$337,798,627	\$399,224,313	
Total Construction and Right of Way					\$456,171,200	\$530,870,028	
Grand Total					\$686,537,656	\$798,959,392	

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
				<b>I-5: Beg DT Burbank Sta to Beg Exist LAUS or To Beg LAUS South (Cut &amp; Cover at Silver Lake) (Opt 3.04F)</b>	
<b>AREA 3: San Fernando Valley</b>					
<b>Track Items</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		17.340	
2	Double Track Section - At-Grade	km	\$846,282	1.100	\$930,910
3	Double Track Section - On Structure	km	\$1,600,459	10.740	\$17,188,932
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	5.500	\$8,802,526
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	48.576	\$500,045
2	Total Cut	m3	\$7.59	0.0	\$0
3	Total Fill	m3	\$7.59	41,800.0	\$317,058
6	Landscape/Erosion Control	Hectares	\$6,881	0.060	\$413
7	Security Fencing (Both Sides of R/W)	km	\$86,687	1.100	\$95,356
8	Special Drainage Facilities	5% of Earthwork Cost			\$45,644
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	5.980	\$69,982,438
2	High Structure	km	\$14,043,299	4.090	\$57,437,091
3	Long Span Structure	km	\$32,020,021	0.650	\$20,813,014
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	2.400	\$113,427,814
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	3.100	\$127,119,774
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	5.500	\$9,051,475
16	Retaining Walls	km	\$3,749,214	2.200	\$8,248,271
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea		0	\$0
2	Terminal Passenger Stations	ea		0	\$0
3	Parking - Structure	space	\$14,244	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	1.560	\$1,690,397
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	17.400	\$10,087,119
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	51.300	\$119,668,985
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$14,635,811
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	17.340	\$12,494,960
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	17.340	\$10,334,177
3	Wayside Protection System	km	\$57,213	17.340	\$992,081
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	17.340	\$6,388,401
2	Traction Power Distribution	km	\$686,995	17.340	\$11,912,488
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$158,652,121
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$155,541,295
<b>Total Construction</b>					<b>\$487,860,383</b>
<b>Total Construction and Right of Way</b>					<b>\$622,165,179</b>
<b>Grand Total</b>					<b>\$936,358,594</b>

**QUANTITY WORKSHEET - AREA 3 - SUMMARY OF STATIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
<b>AREA 3: San FernandoValley</b>				<b>Sylmar Station (Option 3.05 )</b>		<b>Burbank Airport Station (Option 3.06)</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		0.000		0.000	
2	Double Track Section - At-Grade	km	\$846,282	0.000	\$0	0.000	\$0
3	Double Track Section - On Structure	km	\$1,600,459	0.000	\$0	0.000	\$0
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3	\$7.59	0.0	\$0	0.0	\$0
3	Total Fill	m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	0.000	\$0	0.000	\$0
8	Special Drainage Facilities	5% of Earthwork Cost			\$0		\$0
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	0.000	\$0	0.000	\$0
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0		\$0
11	Crossovers	ea	\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km	\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0	0.000	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0	0	\$0
<b>Building Items</b>							
1	Intermediate Passenger Stations			1		1	
	Sylmar Station (Aerial)		\$171,844,500	1	\$171,844,500	0	\$0
	Burbank Airport Station (In Trench)		\$366,068,000	0	\$0	1	\$366,068,000
	Burbank Downtown Station (Metrolink/UPRR Variant) (Aerial)		\$171,844,500	0	\$0	0	\$0
	Burbank Downtown Station (I-5 Variant) (Aerial)		\$171,844,500	0	\$0	0	\$0
2	Terminal Passenger Stations			0			
3	Parking - Structure	space	\$14,244	1,404	\$19,998,576	1,073	\$15,283,812
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0	0.000	\$0
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.280	\$979,746	0.280	\$979,746
	Urban	Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0	0.000	\$0
<b>Environmental Mitigation</b>							
	Environmental Mitigation	3% of Line Cost		N/A	\$5,755,292	N/A	11440554.36
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	0.000	\$0	0.000	\$0
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	0.000	\$0	0.000	\$0
3	Wayside Protection System	km	\$57,213	0.000	\$0	0.000	\$0
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	0.000	\$0	0.000	\$0
2	Traction Power Distribution	km	\$686,995	0.000	\$0	0.000	\$0
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles					
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea					
<b>Program Implementation Costs</b>							
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$50,637,419		100411888.7
<b>Contingencies</b>							
	Contingencies	25% of Total Construction Cost			\$49,644,529		98443028.11
<b>Total Construction</b>					<b>\$191,843,076</b>		<b>\$381,351,812</b>
<b>Total Construction and Right of Way</b>					<b>\$198,578,114</b>		<b>\$393,772,112</b>
<b>Grand Total</b>					<b>\$298,860,062</b>		<b>\$592,627,029</b>

**QUANTITY WORKSHEET - AREA 3 - SUMMARY OF STATIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					Burbank Downtown Station (Metrolink/UPRR variant) (Option 3.07)		Burbank Downtown Station (I-5 variant) (Option 3.08)	
AREA 3: San FernandoValley								
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total		km		0.000		0.000	
2	Double Track Section - At-Grade		km	\$846,282	0.000	\$0	0.000	\$0
3	Double Track Section - On Structure		km	\$1,600,459	0.000	\$0	0.000	\$0
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track		km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction		km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped		Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut		m3	\$7.59	0.0	\$0	0.0	\$0
3	Total Fill		m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control		Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)		km	\$86,687	0.000	\$0	0.000	\$0
8	Special Drainage Facilities		5% of Earthwork Cost				\$0	
Structures/Tunnels/Walls								
1	Standard Structure		km	\$11,702,749	0.000	\$0	0.000	\$0
2	High Structure		km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary		km	\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0.000	\$0	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592		\$0		\$0
8	Double Track Drill & Blast		km	\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844		\$0		\$0
11	Crossovers		ea	\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long		km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls		km	\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls		km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench		ea	\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	0	\$0	0	\$0
Building Items								
1	Intermediate Passenger Stations				1		1	
	Sylmar Station (Aerial)			\$171,844,500	0	\$0	0	\$0
	Burbank Airport Station (In Trench)			\$366,068,000	0	\$0	0	\$0
	Burbank Downtown Station (Metrolink/UPRR Variant) (Aerial)			\$171,844,500	1	\$171,844,500	0	\$0
	Burbank Downtown Station (I-5 Variant) (Aerial)			\$171,844,500	0	\$0	1	\$171,844,500
2	Terminal Passenger Stations				0		0	
3	Parking - Structure		space	\$14,244	1,073	\$15,283,812	1,073	\$15,283,812
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)		km	\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban		km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban		km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped		km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban		Hectares	\$3,499,093	0.000	\$0	0.000	\$0
	Urban		Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban		Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban		Hectares	\$3,499,093	0.280	\$979,746	0.280	\$979,746
	Urban		Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban		Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation								
Environmental Mitigation			3% of Line Cost		N/A	5613849.36	N/A	5613849.36
Signals and Communication								
1	Signaling (ATC)		km	\$720,586	0.000	\$0	0.000	\$0
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	0.000	\$0	0.000	\$0
3	Wayside Protection System		km	\$57,213	0.000	\$0	0.000	\$0
Electrification Items								
1	Traction Power Supply		km	\$368,420	0.000	\$0	0.000	\$0
2	Traction Power Distribution		km	\$686,995	0.000	\$0	0.000	\$0
Vehicle Costs								
1	Fleet size estimate		vehicles					
Support Facility Costs								
1	Facility cost breakdown		ea					
Program Implementation Costs								
Program Implementation Costs			25.5% of Total Cost and Procurement			49399086.4		49399086.4
Contingencies								
Contingencies			25% of Total Construction Cost			48430476.86		48430476.86
Total Construction						\$187,128,312		\$187,128,312
Total Construction and Right of Way						\$193,721,907		\$193,721,907
Grand Total						\$291,551,471		\$291,551,471

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					Existing LAUS w/ South Connection (Option 4.01)		Existing LAUS w/East Connection (Option 4.02)	
AREA 4: Los Angeles Union Station								
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			5.730		5.890	
2	Double Track Section - At-Grade	km		\$846,282	0.000	\$0	0.000	\$0
3	Double Track Section - On Structure	km		\$1,600,459	5.730	\$9,170,632	5.890	\$9,426,705
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km		\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	17.365	\$178,757	17.876	\$184,017
2	Total Cut	m3		\$7.59	0.0	\$0	0.0	\$0
3	Total Fill	m3		\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares		\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km		\$86,687	0.000	\$0	0.000	\$0
8	Special Drainage Facilities	5% of Earthwork Cost				\$8,938		\$9,201
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	0.270	\$3,159,742	1.500	\$17,554,123
2	High Structure	km		\$14,043,299	5.150	\$72,322,987	4.380	\$61,509,647
3	Long Span Structure	km		\$32,020,021	0.300	\$9,606,006	0.000	\$0
4	Waterway Crossing - Primary	km		\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.000	\$0	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	0	\$0	0	\$0
Building Items								
1	Intermediate Passenger Stations	ea			0	\$0	0	\$0
2	Terminal Passenger Stations		N/A		1		1	
	Existing LAUS with South Connection	ea		\$96,324,000	1	\$96,324,000	0	\$0
	Existing LAUS with East Connection	ea		\$96,324,000	0	\$0	1	\$96,324,000
	LAUS South	ea		\$96,324,000	0	\$0	0	\$0
	LAUS East Bank (Over 110-Fwy Variant)	ea		\$96,324,000	0	\$0	0	\$0
	LAUS East Bank (Under 110-Fwy Variant)	ea		\$96,324,000	0	\$0	0	\$0
3	Parking - Structure	space		\$14,244	3.036	\$43,244,784	3.036	\$43,244,784
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km		\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	5.800	\$4,399,367	5.900	\$4,475,218
5	Major Utility Relocations - Urban	km		\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km		\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km		\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km		\$11,919	0.000	\$0	0.000	\$0
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares		\$3,499,093	17.700	\$61,933,948	18.100	\$63,333,585
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	Hectares		\$3,499,093	5.120	\$17,915,357	5.120	\$17,915,357
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation								
	Environmental Mitigation	3% of Line Cost				\$7,570,034		\$7,411,068
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	5.730	\$4,128,957	5.890	\$4,244,251
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	5.730	\$3,414,927	5.890	\$3,510,283
3	Wayside Protection System	km		\$57,213	5.730	\$327,833	5.890	\$336,987
Electrification Items								
1	Traction Power Supply	km		\$368,420	5.730	\$2,111,046	5.890	\$2,169,993
2	Traction Power Distribution	km		\$686,995	5.730	\$3,936,480	5.890	\$4,046,399
Vehicle Costs								
1	Fleet size estimate	vehicles						
Support Facility Costs								
1	Facility cost breakdown	ea						
Program Implementation Costs								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$86,637,217		\$85,602,383
Contingencies								
	Contingencies	25% of Total Construction Cost				\$84,938,449		\$83,923,905
Total Construction						\$252,334,455	\$247,035,608	
Total Construction and Right of Way						\$339,753,794	\$335,695,619	
Grand Total						\$511,329,460	\$505,221,900	



**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
					LAUS South (Option 4.03)		LAUS East Bank (Over 110-FWY variant) (Option 4.04A)	
AREA 4: Los Angeles Union Station								
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km			5.230		7.310	
2	Double Track Section - At-Grade	km		\$846,282	0.000	\$0	0.000	\$0
3	Double Track Section - On Structure	km		\$1,600,459	5.230	\$8,370,402	7.310	\$11,699,357
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km		\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	15.845	\$163,110	22.159	\$228,107
2	Total Cut	m3		\$7.59	0.0	\$0	0.0	\$0
3	Total Fill	m3		\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares		\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km		\$86,687	0.000	\$0	0.000	\$0
8	Special Drainage Facilities	5% of Earthwork Cost				\$8,155		\$11,405
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	1.230	\$14,394,381	0.540	\$6,319,484
2	High Structure	km		\$14,043,299	3.980	\$55,892,328	6.560	\$92,124,038
3	Long Span Structure	km		\$32,020,021	0.000	\$0	0.200	\$6,404,004
4	Waterway Crossing - Primary	km		\$24,606,000	0.000	\$0	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0.000	\$0	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150		\$0		\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589	0.000	\$0	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592		\$0		\$0
8	Double Track Drill & Blast	km		\$71,355,733		\$0		\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758		\$0		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844		\$0		\$0
11	Crossovers	ea		\$80,782,844		\$0		\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km		\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km		\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0.000	\$0	0.000	\$0
16	Retaining Walls	km		\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls	km		\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		\$1,500,000	0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	0	\$0	0	\$0
Building Items								
1	Intermediate Passenger Stations	ea			0	\$0	0	\$0
2	Terminal Passenger Stations		N/A		1		1	
	Existing LAUS with South Connection	ea		\$96,324,000	0	\$0	0	\$0
	Existing LAUS with East Connection	ea		\$96,324,000	0	\$0	0	\$0
	LAUS South	ea		\$96,324,000	1	\$96,324,000	0	\$0
	LAUS East Bank (Over 110-Fwy Variant)	ea		\$96,324,000	0	\$0	1	\$96,324,000
	LAUS East Bank (Under 110-Fwy Variant)	ea		\$96,324,000	0	\$0	0	\$0
3	Parking - Structure	space		\$14,244	3.036	\$43,244,784	3.036	\$43,244,784
4	Parking - At Grade	space		\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km		\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	5.300	\$4,020,111	7.300	\$5,537,134
5	Major Utility Relocations - Urban	km		\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km		\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km		\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km		\$11,919	0.000	\$0	0.000	\$0
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	Hectares		\$3,499,093	16.100	\$56,335,399	22.500	\$78,729,595
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	Hectares		\$3,499,093	4.800	\$16,795,647	4.800	\$16,795,647
	Urban	Hectares		\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban	Hectares		\$1,166,364	0.000	\$0	0.000	\$0
	Suburban	Hectares		\$408,227	0.000	\$0	0.000	\$0
	Undeveloped	Hectares		\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation								
	Environmental Mitigation	3% of Line Cost				\$7,053,658		\$8,389,490
Signals and Communication								
1	Signaling (ATC)	km		\$720,586	5.230	\$3,768,664	7.310	\$5,267,483
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	5.230	\$3,116,940	7.310	\$4,356,565
3	Wayside Protection System	km		\$57,213	5.230	\$299,226	7.310	\$418,230
Electrification Items								
1	Traction Power Supply	km		\$368,420	5.230	\$1,926,836	7.310	\$2,693,149
2	Traction Power Distribution	km		\$686,995	5.230	\$3,592,982	7.310	\$5,021,931
Vehicle Costs								
1	Fleet size estimate	vehicles						
Support Facility Costs								
1	Facility cost breakdown	ea						
Program Implementation Costs								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$80,403,189		\$97,808,923
Contingencies								
	Contingencies	25% of Total Construction Cost				\$78,826,656		\$95,891,101
Total Construction						\$235,121,920	\$279,649,672	
Total Construction and Right of Way						\$315,306,624	\$383,564,405	
Grand Total						\$474,536,469	\$577,264,421	

**QUANTITY WORKSHEET - SUMMARY OF ALIGNMENT OPTIONS**  
**CAPITAL COST ESTIMATES**  
**CA HSRA PROGRAM EIR/EIS**  
**BAKERSFIELD TO LOS ANGELES CORRIDOR**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
				LAUS East Bank (Under 110-FWY variant) (Option 4.04B)	
AREA 4: Los Angeles Union Station					
Track			Quantities		Item Cost
1	Double Track Section - Total	km		7.310	
2	Double Track Section - At-Grade	km	\$846,282	0.000	\$0
3	Double Track Section - On Structure	km	\$1,600,459	7.310	\$11,699,357
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
Earthwork and Related Items					
1	Site Preparation - Undeveloped	Hectares	\$10,294	22.159	\$228,107
2	Total Cut	m3	\$7.59	0.0	\$0
3	Total Fill	m3	\$7.59	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	0.000	\$0
8	Special Drainage Facilities	5% of Earthwork Cost			\$11,405
Structures/Tunnels/Walls					
1	Standard Structure	km	\$11,702,749	1.180	\$13,809,244
2	High Structure	km	\$14,043,299	5.920	\$83,136,327
3	Long Span Structure	km	\$32,020,021	0.200	\$6,404,004
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150		\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592		\$0
8	Double Track Drill & Blast	km	\$71,355,733		\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758		\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844		\$0
11	Crossovers	ea	\$80,782,844		\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0
16	Retaining Walls	km	\$3,749,214	0.000	\$0
17	Containment Walls	km	\$1,278,634	0.000	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0
Grade Separations					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea	\$1,500,000	0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
Building Items					
1	Intermediate Passenger Stations	ea		0	\$0
2	Terminal Passenger Stations		N/A	1	
	Existing LAUS with South Connection	ea	\$96,324,000	0	\$0
	Existing LAUS with East Connection	ea	\$96,324,000	0	\$0
	LAUS South	ea	\$96,324,000	0	\$0
	LAUS East Bank (Over 110-Fwy Variant)	ea	\$96,324,000	0	\$0
	LAUS East Bank (Under 110-Fwy Variant)	ea	\$96,324,000	1	\$96,324,000
3	Parking - Structure	space	\$14,244	3.036	\$43,244,784
4	Parking - At Grade	space	\$2,042	0	\$0
Rail and Utility Relocation					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	7.300	\$5,537,134
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0
Right-of-Way					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	22.500	\$78,729,595
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	4.800	\$16,795,647
	Urban	Hectares	\$2,332,729	0.000	\$0
	Dense Suburban	Hectares	\$1,166,364	0.000	\$0
	Suburban	Hectares	\$408,227	0.000	\$0
	Undeveloped	Hectares	\$291,591	0.000	\$0
Environmental Mitigation					
	Environmental Mitigation	3% of Line Cost			\$8,344,552
Signals and Communication					
1	Signaling (ATC)	km	\$720,586	7.310	\$5,267,483
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	7.310	\$4,356,565
3	Wayside Protection System	km	\$57,213	7.310	\$418,230
Electrification Items					
1	Traction Power Supply	km	\$368,420	7.310	\$2,693,149
2	Traction Power Distribution	km	\$686,995	7.310	\$5,021,931
Vehicle Costs					
1	Fleet size estimate	vehicles			
Support Facility Costs					
1	Facility cost breakdown	ea			
Program Implementation Costs					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$97,415,486
Contingencies					
	Contingencies	25% of Total Construction Cost			\$95,505,379
Total Construction					\$278,151,721
Total Construction and Right of Way					\$382,021,514
Grand Total					\$574,942,379

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Bakersfield - Los Angeles  
Tehachapi Crossing**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost				I-5 Tehachapi Crossing Option		Soledad Canyon Alignment option	
Track				Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km		90.805		55.247	
2	Double Track Section - At-Grade	km	\$846,282	38.050	\$32,201,034	30.665	\$25,951,241
3	Double Track Section - On Structure	km	\$1,600,459	15.755	\$25,215,235	12.997	\$20,801,169
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	37.000	\$59,216,992	11.585	\$18,541,320
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items							
1	Site Preparation - Undeveloped	Hectares	\$10,294	589.619	\$6,069,590	371.281	\$3,822,002
2	Total Cut	m3	\$7.59	90319373.8	\$685,082,831	33108368.2	\$251,130,778
3	Total Fill	m3	\$7.59	60009367.3	\$455,177,948	21926507.1	\$166,315,076
6	Landscape/Erosion Control	Hectares	\$6,881	589.619	\$4,057,042	371.281	\$2,554,706
7	Security Fencing (Both Sides of R/W)	km	\$86,687	38.050	\$3,298,441	30.665	\$2,658,258
8	Special Drainage Facilities	5% of Earthwork Cost			\$57,684,293		\$21,324,041
Structures/Tunnels/Walls							
1	Standard Structure	km	\$11,702,749	12.605	\$147,513,148	12.647	\$148,004,663
2	High Structure	km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure	km	\$32,020,021	3.050	\$97,661,064	0.250	\$8,005,005
4	Waterway Crossing - Primary	km	\$24,606,000	0.100	\$2,460,600	0.100	\$2,460,600
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	37.000	\$1,748,678,799	11.585	\$547,525,510
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	37.000	\$60,891,739	11.585	\$19,065,697
16	Retaining Walls	km	\$3,749,214	2.300	\$8,623,192	0.00	\$0
17	Containment Walls	km	\$1,278,634	0.00	\$0	0.00	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.00	\$0	0.00	\$0
Grade Separations							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	2	\$11,052,596	2	\$11,052,596
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	7	\$6,523,199	1	\$931,886
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	3	\$2,958,195
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	1	\$151,702	0	\$0
Building Items							
1	Intermediate Passenger Stations	ea					
2	Terminal Passenger Stations	ea					
3	Parking - Structure	space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	53.805	\$641,327	43.662	\$520,428
Right of Way Items							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	0	\$0	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares	\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591	276.77364	\$80,704,712	168.392856	\$49,101,847
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0	\$0	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0	0	\$0
	Suburban	Hectares	\$408,227	0	\$0	0	\$0
	Undeveloped	Hectares	\$291,591	0	\$0	0	\$0
Environmental Mitigation							
Environmental Mitigation		3% of Line Cost			\$108,983,494		\$41,634,854
Signals and Communication							
1	Signaling (ATC)	km	\$720,586	90.805	\$65,432,804	55.247	\$39,810,210
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	90.805	\$54,117,357	55.247	\$32,925,738
3	Wayside Protection System	km	\$57,213	90.805	\$5,195,266	55.247	\$3,160,871
Electrification Items							
1	Traction Power Supply	km	\$368,420	90.805	\$33,454,366	55.247	\$20,354,092
2	Traction Power Distribution	km	\$686,995	90.805	\$62,382,553	55.247	\$37,954,396
Vehicle Costs							
1	Fleet size estimate	vehicles	44000000		\$0		\$0
Support Facility Costs							
1	Facility cost breakdown	ea	0		\$0		\$0
Program Implementation Costs							
Program Implementation Costs		25.5% of Total Cost and Procurement			\$974,730,188		\$377,034,121
Contingencies							
Contingencies		25% of Total Construction Cost			\$955,617,831		\$369,641,295
Total Construction					\$3,632,783,120	\$1,387,828,479	
Total Construction and Right of Way					\$3,822,471,325	\$1,478,565,180	
Grand Total					\$5,752,819,344	\$2,225,240,596	

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Bakersfield - Los Angeles**  
**Tehachapi Crossing**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>SR-58 Alignment Option</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		73.847	
2	Double Track Section - At-Grade	km	\$846,282	61.700	\$52,215,606
3	Double Track Section - On Structure	km	\$1,600,459	2.147	\$3,436,186
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	10.000	\$16,004,593
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	658.284	\$6,776,427
2	Total Cut	m3	\$7.59	65708237.4	\$498,404,532
3	Total Fill	m3	\$7.59	44107775.0	\$334,562,543
6	Landscape/Erosion Control	Hectares	\$6,881	658.284	\$4,529,507
7	Security Fencing (Both Sides of R/W)	km	\$86,687	61.700	\$5,348,590
8	Special Drainage Facilities	5% of Earthwork Cost			\$42,481,080
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	1.747	\$20,444,702
2	High Structure	km	\$14,043,299	0.000	\$0
3	Long Span Structure	km	\$32,020,021	0.400	\$12,808,008
4	Waterway Crossing - Primary	km	\$24,606,000	0.000	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0.000	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	10.000	\$472,615,892
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0
13	Trench Short	km	\$42,322,835	0.000	\$0
14	Trench Long	km	\$33,464,567	0.000	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	10.000	\$16,457,227
16	Retaining Walls	km	\$3,749,214	0.00	\$0
17	Containment Walls	km	\$1,278,634	0.00	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0.00	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	35	\$32,615,994
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	15	\$14,790,974
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations	ea			
2	Terminal Passenger Stations	ea			
3	Parking - Structure	space	\$14,244	0	\$0
4	Parking - At Grade	space	\$2,042	0	\$0
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0
5	Major Utility Relocations - Urban	km	\$579,719	0.000	\$0
6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0
7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0
8	Major Utility Relocations - Undeveloped	km	\$11,919	63.847	\$761,022
<b>Right of Way Items</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0
	Suburban	Hectares	\$408,227	0	\$0
	Undeveloped	Hectares	\$291,591	225.085656	\$65,632,959
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	0	\$0
	Urban	Hectares	\$2,332,729	0	\$0
	Dense Suburban	Hectares	\$1,166,364	0	\$0
	Suburban	Hectares	\$408,227	0	\$0
	Undeveloped	Hectares	\$291,591	0	\$0
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$51,409,232
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	73.847	\$53,213,108
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	73.847	\$44,010,841
3	Wayside Protection System	km	\$57,213	73.847	\$4,225,041
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	73.847	\$27,206,702
2	Traction Power Distribution	km	\$686,995	73.847	\$50,732,497
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles	44000000		\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea	0		\$0
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$466,824,232
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$457,670,816
<b>Total Construction</b>					<b>\$1,713,641,072</b>
<b>Total Construction and Right of Way</b>					<b>\$1,830,683,264</b>
<b>Grand Total</b>					<b>\$2,755,178,312</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Riverside - San Diego**  
**Segment 1**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES			
<b>Alignment Cost</b>				<b>1A Colton Line</b>		<b>1B UPRR</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>	<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		91.66		106.81	
2	Double Track Section - At-Grade	km	\$846,282	57.00	\$48,238,080	65.20	\$55,177,594
3	Double Track Section - On Structure	km	\$1,600,459	34.66	\$55,471,918	41.61	\$66,595,109
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.00	\$0	0.00	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.00	\$0	0.00	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.00	\$0	0.00	\$0
6	Freight Double Track	km	\$846,282	0.00	\$0	0.00	\$0
7	Freight Single Track	km	\$423,141	0.00	\$0	0.00	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.00	\$0	0.00	\$0
<b>Earthwork and Related Items</b>							
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3	\$7.59	473100.0	\$3,588,518	541160.0	\$4,104,761
3	Total Fill	m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	57.000	\$4,941,161	65.200	\$5,651,994
8	Special Drainage Facilities		5% of Earthwork Cost		\$426,484		\$487,838
<b>Structures/Tunnels/Walls</b>							
1	Standard Structure	km	\$11,702,749	34.66	\$405,617,272	41.61	\$486,951,376
2	High Structure	km	\$14,043,299	0	\$0	0	\$0
3	Long Span Structure	km	\$32,020,021	0	\$0	0	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0	0	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0	0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0	0	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0	0	\$0
13	Trench Short	km	\$42,322,835	0	\$0	0	\$0
14	Trench Long	km	\$33,464,567	13.2	\$441,732,283	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0	\$0	0	\$0
16	Retaining Walls	km	\$3,749,214	0	\$0	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0	0	\$0
<b>Grade Separations</b>							
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	36	\$550,029,191	18	\$275,014,596
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0	0	\$0
21	Minor crossing closures	ea	\$151,702	12	\$1,820,428	6	\$910,214
<b>Building Items</b>							
1	Intermediate Passenger Stations						
	El Monte (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	1	\$26,979,000	0	\$0
	Pomona (Intermediate, aerial, near existing tracks)	ea	\$164,703,000	1	\$164,703,000	0	\$0
	Ontario (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	1	\$26,979,000	1	\$26,979,000
	Colton (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	1	\$26,979,000	0	\$0
	UCR (Intermediate, aerial, not near existing tracks)	ea	\$86,388,000	1	\$86,388,000	1	\$86,388,000
	South El Monte (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	0	\$0	0	\$0
	City of Industry (Intermediate, at-grade, near exist tracks)	ea	\$28,704,000	0	\$0	1	\$28,704,000
	San Bernardino (Intermediate, aerial, not near existing tracks)	ea	\$86,388,000	0	\$0	0	\$0
2	Terminal Passenger Stations	ea					
3	Parking Requirements						
	El Monte (4-level auto parking structure)	space	\$14,244	3709	\$52,830,996	0	\$0
	Pomona (3-level and 4-level auto parking structures)	space	\$14,244	3709	\$52,830,996	0	\$0
	Ontario (surface parking)	space	\$2,042	732	\$1,494,744	732	\$1,494,744
	Colton (surface parking)	space	\$2,042	1333	\$2,721,986	0	\$0
	UCR (1 to 2-level and 2 to 3-level auto parking structures)	space	\$14,244	1333	\$18,987,252	1333	\$18,987,252
	South El Monte (2-level auto parking structure)	space	\$14,244	0	\$0	0	\$0
	City of Industry (2-level structure and surface auto parking)	space	\$14,244	0	\$0	3709	\$52,830,996
	San Bernardino (3-level, off-site auto parking structure)	space	\$14,244	0	\$0	0	\$0
<b>Rail and Utility Relocation</b>							
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	165.72	\$179,572,178	175.62	\$190,299,698
3	Single Track Removal	km	\$54,000	0.00	\$0	0.00	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	23.59	\$17,889,937	27.48	\$20,846,871
5	Major Utility Relocations - Urban	km	\$579,719	16.71	\$9,689,070	19.48	\$11,290,525
6	Major Utility Relocations - Dense Suburban	km	\$406,345	9.149	\$3,717,560	10.661	\$4,332,016
7	Major Utility Relocations - Suburban	km	\$232,971	1.789	\$416,897	2.085	\$485,804
8	Major Utility Relocations - Undeveloped	km	\$11,919	40.423	\$481,818	47.104	\$561,455
<b>Right-of-Way</b>							
1	Right-of-Way Required for Each Segment						
	Dense Urban	Hectares	\$3,499,093	35.94	\$125,772,911	41.89	\$146,561,255
	Urban	Hectares	\$2,332,729	25.47	\$59,417,366	29.68	\$69,238,150
	Dense Suburban	Hectares	\$1,166,364	13.943	\$16,262,295	16.25	\$18,950,204
	Suburban	Hectares	\$408,227	5.454	\$2,226,607	6.36	\$2,594,631
	Undeveloped	Hectares	\$291,591	123.209	\$35,926,545	143.57	\$41,864,654
2	Right-of-Way Required for Passenger Station & Parking Facilities						
	Dense Urban	Hectares	\$3,499,093	0.0	\$0	0.0	\$0
	Urban (UCR)	Hectares	\$2,332,729	2.0	\$4,665,457	2.0	\$4,665,457
	Dense Suburban	Hectares	\$1,166,364	0.0	\$0	0.0	\$0
	Suburban (Ontario, City of Industry)	Hectares	\$408,227	8.0	\$3,265,820	4.0	\$1,632,910
	Undeveloped	Hectares	\$291,591	0.0	\$0	0.0	\$0
<b>Environmental Mitigation</b>							
	Environmental Mitigation		3% of Line Cost		\$72,215,582		\$47,926,660
<b>Signals and Communication</b>							
1	Signaling (ATC)	km	\$720,586	91.660	\$66,048,905	106.810	\$76,965,782
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	91.660	\$54,626,914	106.810	\$63,655,910
3	Wayside Protection System	km	\$57,213	91.660	\$5,244,184	106.810	\$6,110,967
<b>Electrification Items</b>							
1	Traction Power Supply	km	\$368,420	91.660	\$33,769,365	106.810	\$39,350,926
2	Traction Power Distribution	km	\$686,995	91.660	\$62,969,934	106.810	\$73,377,903
<b>Vehicle Costs</b>							
1	Fleet size estimate	vehicles			\$0		\$0
<b>Support Facility Costs</b>							
1	Facility cost breakdown	ea			\$0		\$0
<b>Program Implementation Costs</b>							
	Program Implementation Costs		25.5% of Total Cost and Procurement		\$695,369,357		\$492,402,259
<b>Contingencies</b>							
	Contingencies		25% of Total Construction Cost		\$681,734,663		\$482,747,313
<b>Total Construction</b>					<b>\$2,407,186,071</b>		<b>\$1,597,555,331</b>
<b>Total Construction and Right of Way</b>					<b>\$2,726,938,653</b>		<b>\$1,930,989,252</b>
<b>Grand Total</b>					<b>\$4,104,042,673</b>		<b>\$2,906,138,825</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Riverside - San Diego**  
**Segment 1**

COST ELEMENTS		UNIT	UNIT PRICE	QUANTITIES	
<b>Alignment Cost</b>				<b>1C San Bernardino Loop (On the Colton Line)</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km		101.62	
2	Double Track Section - At-Grade	km	\$846,282	67.25	\$56,912,472
3	Double Track Section - On Structure	km	\$1,600,459	34.37	\$55,007,784
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.00	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.00	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.00	\$0
6	Freight Double Track	km	\$846,282	0.00	\$0
7	Freight Single Track	km	\$423,141	0.00	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.00	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0
2	Total Cut	m3	\$7.59	558175.0	\$4,233,822
3	Total Fill	m3	\$7.59	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	67.250	\$5,829,703
8	Special Drainage Facilities		5% of Earthwork Cost		\$503,176
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	34.37	\$402,223,475
2	High Structure	km	\$14,043,299	0	\$0
3	Long Span Structure	km	\$32,020,021	0	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0
13	Trench Short	km	\$42,322,835	0	\$0
14	Trench Long	km	\$33,464,567	13.2	\$441,732,283
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0	\$0
16	Retaining Walls	km	\$3,749,214	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	57	\$870,879,553
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	12	\$1,820,428
<b>Building Items</b>					
1	Intermediate Passenger Stations				
	El Monte (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	1	\$26,979,000
	Pomona (Intermediate, aerial, near existing tracks)	ea	\$164,703,000	1	\$164,703,000
	Ontario (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	1	\$26,979,000
	Colton (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	0	\$0
	UCR (Intermediate, aerial, not near existing tracks)	ea	\$86,388,000	1	\$86,388,000
	South El Monte (Intermediate, at-grade, near exist tracks)	ea	\$26,979,000	0	\$0
	City of Industry (Intermediate, at-grade, near exist tracks)	ea	\$28,704,000	0	\$0
	San Bernardino (Intermediate, aerial, not near existing tracks)	ea	\$86,388,000	1	\$86,388,000
2	Terminal Passenger Stations	ea			
3	Parking Requirements				
	El Monte (4-level auto parking structure)	space	\$14,244	3709	\$52,830,996
	Pomona (3-level and 4-level auto parking structures)	space	\$14,244	3709	\$52,830,996
	Ontario (surface parking)	space	\$2,042	732	\$1,494,744
	Colton (surface parking)	space	\$2,042	0	\$0
	UCR (1 to 2-level and 2 to 3-level auto parking structures)	space	\$14,244	1333	\$18,987,252
	South El Monte (2-level auto parking structure)	space	\$14,244	0	\$0
	City of Industry (2-level structure and surface auto parking)	space	\$14,244	0	\$0
	San Bernardino (3-level, off-site auto parking structure)	space	\$14,244	1333	\$18,987,252
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	165.640	\$179,485,491
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	26.15	\$19,833,901
5	Major Utility Relocations - Urban	km	\$579,719	18.53	\$10,741,908
6	Major Utility Relocations - Dense Suburban	km	\$406,345	10.143	\$4,121,519
7	Major Utility Relocations - Suburban	km	\$232,971	1.984	\$462,198
8	Major Utility Relocations - Undeveloped	km	\$11,919	44.815	\$534,174
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	Hectares	\$3,499,093	39.85	\$139,439,703
	Urban	Hectares	\$2,332,729	28.24	\$65,873,802
	Dense Suburban	Hectares	\$1,166,364	15.46	\$18,029,395
	Suburban	Hectares	\$408,227	6.05	\$2,468,556
	Undeveloped	Hectares	\$291,591	136.60	\$39,830,411
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	Hectares	\$3,499,093	0.0	\$0
	Urban (UCR)	Hectares	\$2,332,729	4.0	\$9,330,915
	Dense Suburban	Hectares	\$1,166,364	0.0	\$0
	Suburban (Ontario, City of Industry)	Hectares	\$408,227	6.0	\$2,449,365
	Undeveloped	Hectares	\$291,591	0.0	\$0
<b>Environmental Mitigation</b>					
	Environmental Mitigation		3% of Line Cost		\$85,132,324
<b>Signals and Communication</b>					
1	Signaling (ATC)	km	\$720,586	101.620	\$73,225,941
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	101.620	\$60,562,808
3	Wayside Protection System	km	\$57,213	101.620	\$5,814,030
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	101.620	\$37,438,827
2	Traction Power Distribution	km	\$686,995	101.620	\$69,812,401
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			\$0
<b>Program Implementation Costs</b>					
	Program Implementation Costs		25.5% of Total Cost and Procurement		\$816,076,144
<b>Contingencies</b>					
	Contingencies		25% of Total Construction Cost		\$800,074,651
<b>Total Construction</b>					<b>\$2,837,744,134</b>
<b>Total Construction and Right of Way</b>					<b>\$3,200,298,605</b>
<b>Grand Total</b>					<b>\$4,816,449,401</b>



**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Riverside - San Diego**  
**Segment 2**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					2A Escondido Freeway		2B Escondido - Downtown	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total		km		118.500		118.700	
2	Double Track Section - At-Grade		km	\$846,282	38.100	\$32,243,348	38.100	\$32,243,348
3	Double Track Section - On Structure		km	\$1,600,459	65.700	\$105,150,173	56.400	\$90,265,902
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	14.700	\$23,526,751	24.200	\$38,731,114
5	Double Track Section - In Trench		km	\$1,600,459	0.000	\$0	0.000	\$0
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track		km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction		km	\$1,692,564	0.000	\$0	0.000	\$0
<b>Earthwork and Related Items</b>								
1	Site Preparation - Undeveloped		Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut		m3	\$7.59	316230.0	\$2,398,641	316230.0	\$2,398,641
3	Total Fill		m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control		Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)		km	\$86,687	38.100	\$3,302,776	38.100	\$3,302,776
8	Special Drainage Facilities			5% of Earthwork Cost		\$285,071		\$285,071
<b>Structures/Tunnels/Walls</b>								
1	Standard Structure		km	\$11,702,749	65.7	\$768,870,593	56.4	\$660,035,030
2	High Structure		km	\$14,043,299	0	\$0	0	\$0
3	Long Span Structure		km	\$32,020,021	0	\$0	0	\$0
4	Waterway Crossing - Primary		km	\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150	0	\$0	0	\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	14.7	\$694,745,361	24.2	\$1,143,730,458
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592	0	\$0	0	\$0
8	Double Track Drill & Blast		km	\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844	0	\$0	0	\$0
11	Crossovers		ea	\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379	0	\$0	0	\$0
13	Trench Short		km	\$42,322,835	0	\$0	0	\$0
14	Trench Long		km	\$33,464,567	0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	14.7	\$24,192,123	24.2	\$39,826,489
16	Retaining Walls		km	\$3,749,214	0	\$0	0	\$0
17	Containment Walls		km	\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0	\$0	0	\$0
<b>Grade Separations</b>								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	1	\$15,278,589	1	\$15,278,589
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	3	\$17,554,123	3	\$17,554,123
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	8	\$7,888,520	8	\$7,888,520
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	4	\$606,809	4	\$606,809
<b>Building Items</b>								
1	Intermediate Passenger Stations		ea					
	March ARB (at-grade, not near existing tracks)		ea	\$26,979,000	0	\$0	1	\$26,979,000
	Temecula (aerial, not near existing tracks)		ea	\$164,703,000	1	\$164,703,000	1	\$164,703,000
	Escondido (aerial, not near existing tracks)		ea	\$163,806,000	1	\$163,806,000	0	\$0
	Escondido Transit Ctr (Tunnel, not near existing tracks)		ea	\$366,068,000	0	\$0	1	\$366,068,000
2	Terminal Passenger Stations							
3	Parking Requirements						5228	
	March ARB (surface parking)		space	\$2,042	0	\$0	1333	\$2,721,986
	Temecula (surface parking)		space	\$2,042	2455	\$5,013,110	2455	\$5,013,110
	Escondido (surface parking)		space	\$2,042	1440	\$2,940,480	0	\$0
	Escondido Transit Ctr (surface parking)		space	\$2,042	0	\$0	1440	\$2,940,480
<b>Rail and Utility Relocation</b>								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)		km	\$1,083,588	11.900	\$12,894,695	11.900	\$12,894,695
3	Single Track Removal		km	\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	10.793	\$8,186,420	10.811	\$8,200,236
5	Major Utility Relocations - Urban		km	\$579,719	9.722	\$5,636,020	9.738	\$5,645,532
6	Major Utility Relocations - Dense Suburban		km	\$406,345	30.109	\$12,234,781	30.160	\$12,255,430
7	Major Utility Relocations - Suburban		km	\$232,971	4.260	\$992,531	4.268	\$994,206
8	Major Utility Relocations - Undeveloped		km	\$11,919	63.616	\$758,265	63.723	\$759,544
<b>Right-of-Way</b>								
1	Right-of-Way Required for Each Segment							
	Dense Urban		hectare	\$3,499,093	16.45	\$57,553,575	16.48	\$57,650,712
	Urban		hectare	\$2,332,729	14.82	\$34,562,392	14.84	\$34,620,726
	Dense Suburban		hectare	\$1,166,364	45.89	\$53,520,481	45.96	\$53,610,811
	Suburban		hectare	\$408,227	12.99	\$5,301,009	13.01	\$5,309,956
	Undeveloped		hectare	\$291,591	193.90	\$56,539,655	194.23	\$56,635,081
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban		hectare	\$3,499,093	0.0	\$0	0.0	\$0
	Urban		hectare	\$2,332,729	0.0	\$0	0.0	\$0
	Dense Suburban		hectare	\$1,166,364	0.0	\$0	0.0	\$0
	Suburban (Temecula, Escondido)		hectare	\$408,227	4.0	\$1,632,910	6.0	\$2,449,365
	Undeveloped		hectare	\$291,591	0.0	\$0	0.0	\$0
<b>Environmental Mitigation</b>								
	Environmental Mitigation			3% of Line Cost		\$70,832,006		\$88,489,998
<b>Signals and Communication</b>								
1	Signaling (ATC)		km	\$720,586	118.500	\$85,389,431	118.700	\$85,533,549
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	118.500	\$70,622,838	118.700	\$70,742,033
3	Wayside Protection System		km	\$57,213	118.500	\$6,779,792	118.700	\$6,791,235
<b>Electrification Items</b>								
1	Traction Power Supply		km	\$368,420	118.500	\$43,657,754	118.700	\$43,731,438
2	Traction Power Distribution		km	\$686,995	118.500	\$81,408,871	118.700	\$81,546,270
<b>Vehicle Costs</b>								
1	Fleet size estimate		vehicles			\$0		\$0
<b>Support Facility Costs</b>								
1	Facility cost breakdown		ea			\$0		\$0
<b>Program Implementation Costs</b>								
	Program Implementation Costs			25.5% of Total Cost and Procurement		\$673,457,268		\$828,350,482
<b>Contingencies</b>								
	Contingencies			25% of Total Construction Cost		\$660,252,224		\$812,108,315
<b>Total Construction</b>						<b>\$2,361,066,866</b>		<b>\$2,949,666,613</b>
<b>Total Construction and Right of Way</b>						<b>\$2,641,008,894</b>		<b>\$3,248,433,261</b>
<b>Grand Total</b>						<b>\$3,974,718,386</b>		<b>\$4,888,892,058</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Riverside - San Diego**  
**Segment 3**

COST ELEMENTS			UNIT	UNIT PRICE	Quantities			
Alignment Cost					3A - QualComm		3B - San Diego - Carroll Canyon	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total	km	N/A		15.200		31.100	
2	Double Track Section - At-Grade	km		\$846,282	0.000	\$0	15.450	\$13,075,059
3	Double Track Section - On Structure	km		\$1,600,459	8.200	\$13,123,766	15.650	\$25,047,187
4	Double Track Section - In Tunnel or Subway	km		\$1,600,459	0.000	\$0	0.000	\$0
5	Double Track Section - In Trench	km		\$1,600,459	7.000	\$11,203,215	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km		\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track	km		\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track	km		\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction	km		\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped	Hectares		\$10,294	0.000	\$0	0.000	\$0
2	Total Cut	m3		\$7.59	0.0	\$0	128,235.0	\$972,677
3	Total Fill	m3		\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control	Hectares		\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km		\$86,687	7.000	\$606,809	15.450	\$1,339,315
8	Special Drainage Facilities	5% of Earthwork Cost				\$30,340		\$115,600
Structures/Tunnels/Walls								
1	Standard Structure	km		\$11,702,749	8.2	\$95,962,540	15.7	\$183,148,018
2	High Structure	km		\$14,043,299	0	\$0	0	\$0
3	Long Span Structure	km		\$32,020,021	0	\$0	0	\$0
4	Waterway Crossing - Primary	km		\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km		\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km		\$63,942,150	0	\$0	0	\$0
6	Twin Single Track TBM (<6 Miles)	km		\$47,261,589	0	\$0	0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km		\$67,185,592	0	\$0	0	\$0
8	Double Track Drill & Blast	km		\$71,355,733	0	\$0	0	\$0
9	Double Track Mined (Soft Soil)	km		\$82,012,758	0	\$0	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea		\$80,782,844	0	\$0	0	\$0
11	Crossovers	ea		\$80,782,844	0	\$0	0	\$0
12	Cut & Cover Double Track Tunnel	km		\$41,006,379	0	\$0	0	\$0
13	Trench Short	km		\$42,322,835	7	\$296,259,843	0	\$0
14	Trench Long	km		\$33,464,567	0	\$0	0	\$0
15	Mechanical & Electrical for Tunnels	km		\$1,645,723	0	\$0	0	\$0
16	Retaining Walls	km		\$3,749,214	0	\$0	0	\$0
17	Containment Walls	km		\$1,278,634	0	\$0	0	\$0
18	Single Track Cut and Cover Subway	km		\$25,628,987	0	\$0	0	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)	ea		\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea		\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea		\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)	ea		\$15,278,589	0	\$0	9	\$137,507,298
8	Street Undercrossing HSR - (Suburban)	ea		\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea		\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench	ea			0	\$0	0	\$0
21	Minor crossing closures	ea		\$151,702	0	\$0	3	\$455,107
Building Items								
1	Intermediate Passenger Stations							
	Mira Mesa (Aerial, not near existing tracks)	ea		\$163,806,000	1	\$163,806,000	1	\$163,806,000
	University City Station (At-grade - Suburban)	ea		\$33,453,500	0	\$0	1	\$33,453,500
2	Terminal Passenger Stations	ea						
	Qualcomm (Aerial, not near existing tracks)	ea		\$115,172,500	1	\$115,172,500	0	\$0
	Downtown San Diego (Aerial, near existing tracks)	ea		\$114,977,000	0	\$0	1	\$114,977,000
3	Parking Requirements	space						
	Mira Mesa (surface parking)	space		\$2,042	561	\$1,145,562	561	\$1,145,562
	University City Station (2 to 3-level auto and bus/taxi parking structure)	space		\$14,244	0	\$0	1,375	\$19,585,500
	Qualcomm (4-level structure and surface auto parking)	space		\$14,244	3,153	\$44,911,332	0	\$0
	Downtown San Diego (3-level auto parking structure)	space		\$14,244	0	\$0	1,051	\$14,970,444
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)	km		\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)	km		\$1,083,588	0.000	\$0	37.200	\$40,309,468
3	Single Track Removal	km		\$54,000	0.000	\$0	0.000	\$0
4	Major Utility Relocations - Dense Urban	km		\$758,511	3.385	\$2,567,649	6.926	\$5,253,546
5	Major Utility Relocations - Urban	km		\$579,719	2.509	\$1,454,782	5.134	\$2,976,561
6	Major Utility Relocations - Dense Suburban	km		\$406,345	2.701	\$1,097,568	5.527	\$2,245,681
7	Major Utility Relocations - Suburban	km		\$232,971	0.010	\$2,334	0.020	\$4,775
8	Major Utility Relocations - Undeveloped	km		\$11,919	6.594	\$78,601	13.492	\$160,822
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban	hectare		\$3,499,093	5.16	\$18,051,530	10.56	\$36,934,381
	Urban	hectare		\$2,332,729	3.82	\$8,921,325	7.82	\$18,253,500
	Dense Suburban	hectare		\$1,166,364	4.12	\$4,801,259	8.42	\$9,823,628
	Suburban	hectare		\$408,227	0.03	\$12,464	0.06	\$25,501
	Undeveloped	hectare		\$291,591	20.10	\$5,860,846	41.12	\$11,991,599
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban	hectare		\$3,499,093	0.0	\$0	0.0	\$0
	Urban (Qualcomm)	hectare		\$2,332,729	2.0	\$4,665,457	2.0	\$4,665,457
	Dense Suburban	hectare		\$1,166,364	0.0	\$0	0.0	\$0
	Suburban (Mira Mesa)	hectare		\$408,227	2.0	\$816,455	4.0	\$1,632,910
	Undeveloped	hectare		\$291,591	0.0	\$0	0.0	\$0
Environmental Mitigation								
	Environmental Mitigation	3% of Line Cost				\$23,530,395		\$25,082,905
Signals and Communications								
1	Signalling (ATC)	km		\$720,586	15.200	\$10,952,906	31.100	\$22,410,222
2	Communications (w/Fiber Optic Backbone)	km		\$595,973	15.200	\$9,058,794	31.100	\$18,534,770
3	Wayside Protection System	km		\$57,213	15.200	\$869,644	31.100	\$1,779,338
Electrification Items								
1	Traction Power Supply	km		\$368,420	15.200	\$5,599,982	31.100	\$11,457,858
2	Traction Power Distribution	km		\$686,995	15.200	\$10,442,319	31.100	\$21,365,535
Vehicle Costs								
1	Fleet size estimate	vehicles				\$0		\$0
Support Facility Costs								
1	Facility cost breakdown	ea				\$0		\$0
Program Implementation Costs								
	Program Implementation Costs	25.5% of Total Cost and Procurement				\$217,006,585		\$240,849,215
Contingencies								
	Contingencies	25% of Total Construction Cost				\$212,751,554		\$236,126,681
Total Construction						\$784,346,847	\$836,096,842	
Total Construction and Right of Way						\$851,006,217	\$944,506,724	
Grand Total						\$1,280,764,357	\$1,421,482,620	

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Riverside - San Diego**  
**Segment 3**

COST ELEMENTS		UNIT	UNIT PRICE	Quantities	
<b>Alignment Cost</b>				<b>3C - San Diego - Miramar Road</b>	
<b>Track</b>				<b>Quantities</b>	<b>Item Cost</b>
1	Double Track Section - Total	km	N/A	30.700	
2	Double Track Section - At-Grade	km	\$846,282	7.250	\$6,135,545
3	Double Track Section - On Structure	km	\$1,600,459	23.450	\$37,530,769
4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0
5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0
	Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0
6	Freight Double Track	km	\$846,282	0.000	\$0
7	Freight Single Track	km	\$423,141	0.000	\$0
9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0
<b>Earthwork and Related Items</b>					
1	Site Preparation - Undeveloped	Hectares	\$10,294	0.000	\$0
2	Total Cut	m3	\$7.59	60,175.0	\$456,434
3	Total Fill	m3	\$7.59	0.0	\$0
6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0
7	Security Fencing (Both Sides of R/W)	km	\$86,687	7.250	\$628,481
8	Special Drainage Facilities	5% of Earthwork Cost			\$54,246
<b>Structures/Tunnels/Walls</b>					
1	Standard Structure	km	\$11,702,749	23.5	\$274,429,458
2	High Structure	km	\$14,043,299	0	\$0
3	Long Span Structure	km	\$32,020,021	0	\$0
4	Waterway Crossing - Primary	km	\$24,606,000	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0	\$0
6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0	\$0
7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0	\$0
8	Double Track Drill & Blast	km	\$71,355,733	0	\$0
9	Double Track Mined (Soft Soil)	km	\$82,012,758	0	\$0
10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0	\$0
11	Crossovers	ea	\$80,782,844	0	\$0
12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0	\$0
13	Trench Short	km	\$42,322,835	0	\$0
14	Trench Long	km	\$33,464,567	0	\$0
15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0	\$0
16	Retaining Walls	km	\$3,749,214	0	\$0
17	Containment Walls	km	\$1,278,634	0	\$0
18	Single Track Cut and Cover Subway	km	\$25,628,987	0	\$0
<b>Grade Separations</b>					
1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0
2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0
3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0
7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	0	\$0
8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0
9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0
10	Street Bridging HSR Trench	ea		0	\$0
21	Minor crossing closures	ea	\$151,702	0	\$0
<b>Building Items</b>					
1	Intermediate Passenger Stations				
	Mira Mesa (Aerial, not near existing tracks)	ea	\$163,806,000	1	\$163,806,000
	University City Station (At-grade - Suburban)	ea	\$33,453,500	1	\$33,453,500
2	Terminal Passenger Stations				
	Qualcomm (Aerial, not near existing tracks)	ea	\$115,172,500	0	\$0
	Downtown San Diego (Aerial, near existing tracks)	ea	\$114,977,000	1	\$114,977,000
3	Parking Requirements	space			
	Mira Mesa (surface parking)	space	\$2,042	561	\$1,145,562
	University City Station (2 to 3-level auto and bus/taxi parking structure)	space	\$14,244	1,375	\$19,585,500
	Qualcomm (4-level structure and surface auto parking)	space	\$14,244	0	\$0
	Downtown San Diego (3-level auto parking structure)	space	\$14,244	1,051	\$14,970,444
<b>Rail and Utility Relocation</b>					
1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0
2	Single Track Relocation (Permanent)	km	\$1,083,588	35.000	\$37,925,575
3	Single Track Removal	km	\$54,000	0.000	\$0
4	Major Utility Relocations - Dense Urban	km	\$758,511	6.837	\$5,185,976
5	Major Utility Relocations - Urban	km	\$579,719	5.068	\$2,938,278
6	Major Utility Relocations - Dense Suburban	km	\$406,345	5.455	\$2,216,798
7	Major Utility Relocations - Suburban	km	\$232,971	0.020	\$4,713
8	Major Utility Relocations - Undeveloped	km	\$11,919	13.319	\$158,753
<b>Right-of-Way</b>					
1	Right-of-Way Required for Each Segment				
	Dense Urban	hectare	\$3,499,093	10.42	\$36,459,341
	Urban	hectare	\$2,332,729	7.72	\$18,018,728
	Dense Suburban	hectare	\$1,166,364	8.31	\$9,697,279
	Suburban	hectare	\$408,227	0.06	\$25,173
	Undeveloped	hectare	\$291,591	40.60	\$11,837,366
2	Right-of-Way Required for Passenger Station & Parking Facilities				
	Dense Urban	hectare	\$3,499,093	0.0	\$0
	Urban (Qualcomm)	hectare	\$2,332,729	2.0	\$4,665,457
	Dense Suburban	hectare	\$1,166,364	0.0	\$0
	Suburban (Mira Mesa)	hectare	\$408,227	4.0	\$1,632,910
	Undeveloped	hectare	\$291,591	0.0	\$0
<b>Environmental Mitigation</b>					
	Environmental Mitigation	3% of Line Cost			\$23,705,372
<b>Signals and Communications</b>					
1	Signaling (ATC)	km	\$720,586	30.700	\$22,121,988
2	Communications (w/Fiber Optic Backbone)	km	\$595,973	30.700	\$18,296,381
3	Wayside Protection System	km	\$57,213	30.700	\$1,756,453
<b>Electrification Items</b>					
1	Traction Power Supply	km	\$368,420	30.700	\$11,310,490
2	Traction Power Distribution	km	\$686,995	30.700	\$21,090,737
<b>Vehicle Costs</b>					
1	Fleet size estimate	vehicles			\$0
<b>Support Facility Costs</b>					
1	Facility cost breakdown	ea			\$0
<b>Program Implementation Costs</b>					
	Program Implementation Costs	25.5% of Total Cost and Procurement			\$228,536,281
<b>Contingencies</b>					
	Contingencies	25% of Total Construction Cost			\$224,055,177
<b>Total Construction</b>					<b>\$790,179,081</b>
<b>Total Construction and Right of Way</b>					<b>\$896,220,709</b>
<b>Grand Total</b>					<b>\$1,348,812,167</b>

**Capital Cost Estimate**  
**CAHSRA Program EIR/EIS**  
**Los Angeles - Orange - San Diego**  
**Los Angeles to San Diego (LOSSAN)**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					LAUS-LAX (elec)		LAUS-UP Santa Ana (elec)	
Track					Quantities	Item Cost	Quantities	Item Cost
1	Double Track Section - Total		km		25.350		44.150	
2	Double Track Section - At-Grade		km	\$846,282	1.225	\$1,036,696	4.925	\$4,167,939
3	Double Track Section - On Structure		km	\$1,600,459	9.700	\$15,524,455	21.500	\$34,409,874
4	Double Track Section - In Tunnel or Subway		km	\$1,600,459	2.850	\$4,561,309	4.050	\$6,481,860
5	Double Track Section - In Trench		km	\$1,600,459	11.575	\$18,525,316	13.675	\$21,886,280
	Single Track Sections - In Tunnel or Subway		km	\$1,000,287	0.000	\$0	0.000	\$0
6	Freight Double Track		km	\$846,282	0.000	\$0	0.000	\$0
7	Freight Single Track		km	\$423,141	0.000	\$0	0.000	\$0
9	Four-track construction or reconstruction		km	\$1,692,564	0.000	\$0	0.000	\$0
Earthwork and Related Items								
1	Site Preparation - Undeveloped		Hectares	\$10,294	0.000	\$0	0.000	\$0
2	Total Cut		m3	\$7.59	10167.5	\$77,122	40877.5	\$310,061
3	Total Fill		m3	\$7.59	0.0	\$0	0.0	\$0
6	Landscape/Erosion Control		Hectares	\$6,881	0.000	\$0	0.000	\$0
7	Security Fencing (Both Sides of R/W)		km	\$86,687	12.800	\$1,109,594	18.600	\$1,612,379
8	Special Drainage Facilities		5% of Earthwork Cost			\$59,336		\$96,122
Structures/Tunnels/Walls								
1	Standard Structure		km	\$11,702,749	9.700	\$113,516,663	21.500	\$251,609,098
2	High Structure		km	\$14,043,299	0.000	\$0	0.000	\$0
3	Long Span Structure		km	\$32,020,021	0.000	\$0	0.000	\$0
4	Waterway Crossing - Primary		km	\$24,606,000	0	\$0	0	\$0
	Waterway Crossing - Secondary (Irrigation/Canal Crossing)		km	\$19,700,000	0	\$0	0	\$0
5	Twin Single Track Drill & Blast (<6 Miles)		km	\$63,942,150	0.000	\$0	0.000	\$0
6	Twin Single Track TBM (<6 Miles)		km	\$47,261,589	0.000	\$0	4.050	\$191,409,436
7	Twin Single Track TBM w/3rd Tube (>6 Miles)		km	\$67,185,592	0.000	\$0	0.000	\$0
8	Double Track Drill & Blast		km	\$71,355,733	0.000	\$0	0.000	\$0
9	Double Track Mined (Soft Soil)		km	\$82,012,758	0.000	\$0	0.000	\$0
10	Seismic Chamber (Drill & Blast/Mined)		ea	\$80,782,844	0.000	\$0	0.000	\$0
11	Crossovers		ea	\$80,782,844	0.000	\$0	0.000	\$0
12	Cut & Cover Double Track Tunnel		km	\$41,006,379	2.850	\$116,868,180	0.000	\$0
13	Trench Short		km	\$42,322,835	0.000	\$0	13.675	\$578,764,764
14	Trench Long		km	\$33,464,567	11.575	\$387,352,362	0.000	\$0
15	Mechanical & Electrical for Tunnels		km	\$1,645,723	2.850	\$4,690,310	4.050	\$6,665,177
16	Retaining Walls		km	\$3,749,214	0.000	\$0	0.000	\$0
17	Containment Walls		km	\$1,278,634	0.000	\$0	0.000	\$0
18	Single Track Cut and Cover Subway		km	\$25,628,987	0.000	\$0	0.000	\$0
Grade Separations								
1	Street Overcrossing HSR - (Urban)		ea	\$14,628,436	0	\$0	0	\$0
2	Street Overcrossing HSR - (Suburban)		ea	\$5,526,298	0	\$0	0	\$0
3	Street Overcrossing HSR - (Undeveloped)		ea	\$931,886	0	\$0	0	\$0
7	Street Undercrossing HSR - (Urban)		ea	\$15,278,589	0	\$0	0	\$0
8	Street Undercrossing HSR - (Suburban)		ea	\$5,851,374	0	\$0	0	\$0
9	Street Undercrossing HSR - (Undeveloped)		ea	\$986,065	0	\$0	0	\$0
10	Street Bridging HSR Trench		ea		0	\$0	0	\$0
21	Minor crossing closures		ea	\$151,702	0	\$0	0	\$0
Building Items								
1	Intermediate Passenger Stations							
	Norwalk LAUS-UP Santa Ana		ea	\$28,704,000	0	\$0	1	\$28,704,000
	Norwalk LOSSAN Shared Use		ea	\$10,000,000	0	\$0	0	\$0
	Fullerton LOSSAN Shared Use		ea	\$10,000,000	0	\$0	0	\$0
	Anaheim LOSSAN Shared Use		ea	\$10,000,000	0	\$0	0	\$0
	Santa Ana LOSSAN Shared Use		ea	\$10,000,000	0	\$0	0	\$0
2	Terminal Passenger Stations							
	LAX LAUS-LAX		ea	\$335,903,500	1	\$335,903,500	0	\$0
	Anaheim LAUS-UP Santa Ana		ea	\$335,903,500	0	\$0	1	\$335,903,500
	Irvine LOSSAN Shared Use		ea	\$10,000,000	0	\$0	0	\$0
3	Parking - Structure							
	Norwalk LAUS-UP Santa Ana		space	\$14,244	0	\$0	1140	\$16,238,160
	Anaheim LAUS-UP Santa Ana		space	\$14,244	0	\$0	2300	\$32,761,200
	Anaheim LOSSAN Shared Use		space	\$14,244	0	\$0	0	\$0
	Irvine LOSSAN Shared Use		space	\$14,244	0	\$0	0	\$0
4	Parking - At Grade		space	\$2,042	0	\$0	0	\$0
Rail and Utility Relocation								
1	Single Track Relocation (Temporary)		km	\$1,083,588	0.000	\$0	0.000	\$0
2	Single Track Relocation (Permanent)		km	\$1,083,588	0.000	\$0	37.050	\$40,146,930
3	Single Track Removal		km	\$54,000	23.100	\$1,247,400	0.000	\$0
4	Major Utility Relocations - Dense Urban		km	\$758,511	0.000	\$0	0.000	\$0
5	Major Utility Relocations - Urban		km	\$579,719	25.350	\$14,695,889	40.100	\$23,246,752
6	Major Utility Relocations - Dense Suburban		km	\$406,345	0.000	\$0	0.000	\$0
7	Major Utility Relocations - Suburban		km	\$232,971	0.000	\$0	0.000	\$0
8	Major Utility Relocations - Undeveloped		km	\$11,919	0.000	\$0	0.000	\$0
Right-of-Way								
1	Right-of-Way Required for Each Segment							
	Dense Urban		Hectares	\$3,499,093	38.025	\$133,053,016	126.474	\$442,544,303
	Urban		Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban		Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		Hectares	\$291,591	0.000	\$0	0.000	\$0
2	Right-of-Way Required for Passenger Station & Parking Facilities							
	Dense Urban		Hectares	\$3,499,093	10.500	\$36,740,478	33.400	\$116,869,710
	Urban		Hectares	\$2,332,729	0.000	\$0	0.000	\$0
	Dense Suburban		Hectares	\$1,166,364	0.000	\$0	0.000	\$0
	Suburban		Hectares	\$408,227	0.000	\$0	0.000	\$0
	Undeveloped		Hectares	\$291,591	0.000	\$0	0.000	\$0
Environmental Mitigation								
Environmental Mitigation			3% of Line Cost			\$32,302,441		\$50,449,864
Signals and Communication								
1	Signaling (ATC)		km	\$720,586	25.350	\$18,266,853	44.150	\$31,813,868
2	Communications (w/Fiber Optic Backbone)		km	\$595,973	25.350	\$15,107,924	44.150	\$26,312,222
3	Wayside Protection System		km	\$57,213	25.350	\$1,450,361	44.150	\$2,525,973
Electrification Items								
1	Traction Power Supply		km	\$368,420	25.350	\$9,339,444	44.150	\$16,265,737
2	Traction Power Distribution		km	\$686,995	25.350	\$17,415,316	44.150	\$30,330,816
Vehicle Costs								
1	Fleet size estimate		vehicles			\$0		\$0
Support Facility Costs								
1	Facility cost breakdown		ea			\$0		\$0
Program Implementation Costs								
Program Implementation Costs			25.5% of Total Cost and Procurement			\$326,105,210		\$584,339,137
Contingencies								
Contingencies			25% of Total Construction Cost			\$319,710,990		\$572,881,506
Total Construction						\$1,076,748,027		\$1,681,662,148
Total Construction and Right of Way						\$1,278,843,961		\$2,291,526,026
Grand Total						\$1,924,660,161		\$3,448,746,666

**Capital Cost Estimate  
CAHSRA Program EIR/EIS  
Los Angeles - Orange - San Diego  
Los Angeles to San Diego (LOSSAN)**

COST ELEMENTS			UNIT	UNIT PRICE	QUANTITIES			
Alignment Cost					LAUS-TRV LOSSAN (elec)		LAUS-Anaheim LOSSAN (elec)	
Track					Quantities	Item Cost	Quantities	Item Cost
	1	Double Track Section - Total	km		69.256		48.4	\$1,007,158,194
	2	Double Track Section - At-Grade	km	\$846,282	62.341	\$52,758,073		
	3	Double Track Section - On Structure	km	\$1,600,459	6.915	\$11,067,176		
	4	Double Track Section - In Tunnel or Subway	km	\$1,600,459	0.000	\$0		
	5	Double Track Section - In Trench	km	\$1,600,459	0.000	\$0		
		Single Track Sections - In Tunnel or Subway	km	\$1,000,287	0.000	\$0		
	6	Freight Double Track	km	\$846,282	15.423	\$13,052,209		
	7	Freight Single Track	km	\$423,141	8.500	\$3,596,699		
	9	Four-track construction or reconstruction	km	\$1,692,564	0.000	\$0		
Earthwork and Related Items								
	1	Site Preparation - Undeveloped	Hectares	\$10,294	25.201	\$259,421		
	2	Total Cut	m3	\$7.59	0.0	\$0		
	3	Total Fill	m3	\$7.59	0.0	\$0		
	6	Landscape/Erosion Control	Hectares	\$6,881	0.000	\$0		
	7	Security Fencing (Both Sides of R/W)	km	\$86,687	62.341	\$5,404,156		
	8	Special Drainage Facilities	5% of Earthwork Cost			\$283,179		
Structures/Tunnels/Walls								
	1	Standard Structure	km	\$11,702,749	6.712	\$78,548,850		
	2	High Structure	km	\$14,043,299	0.000	\$0		
	3	Long Span Structure	km	\$32,020,021	0.000	\$0		
	4	Waterway Crossing - Primary	km	\$24,606,000	0.203	\$4,995,018		
		Waterway Crossing - Secondary (Irrigation/Canal Crossing)	km	\$19,700,000	0	\$0		
	5	Twin Single Track Drill & Blast (<6 Miles)	km	\$63,942,150	0.000	\$0		
	6	Twin Single Track TBM (<6 Miles)	km	\$47,261,589	0.000	\$0		
	7	Twin Single Track TBM w/3rd Tube (>6 Miles)	km	\$67,185,592	0.000	\$0		
	8	Double Track Drill & Blast	km	\$71,355,733	0.000	\$0		
	9	Double Track Mined (Soft Soil)	km	\$82,012,758	0.000	\$0		
	10	Seismic Chamber (Drill & Blast/Mined)	ea	\$80,782,844	0.000	\$0		
	11	Crossovers	ea	\$80,782,844	0.000	\$0		
	12	Cut & Cover Double Track Tunnel	km	\$41,006,379	0.000	\$0		
	13	Trench Short	km	\$42,322,835	0.000	\$0		
	14	Trench Long	km	\$33,464,567	0.000	\$0		
	15	Mechanical & Electrical for Tunnels	km	\$1,645,723	0.000	\$0		
	16	Retaining Walls	km	\$3,749,214	0.000	\$0		
	17	Containment Walls	km	\$1,278,634	0.000	\$0		
	18	Single Track Cut and Cover Subway	km	\$25,628,987	0.000	\$0		
Grade Separations								
	1	Street Overcrossing HSR - (Urban)	ea	\$14,628,436	0	\$0		
	2	Street Overcrossing HSR - (Suburban)	ea	\$5,526,298	0	\$0		
	3	Street Overcrossing HSR - (Undeveloped)	ea	\$931,886	0	\$0		
	7	Street Undercrossing HSR - (Urban)	ea	\$15,278,589	41	\$626,422,135		
	8	Street Undercrossing HSR - (Suburban)	ea	\$5,851,374	0	\$0		
	9	Street Undercrossing HSR - (Undeveloped)	ea	\$986,065	0	\$0		
	10	Street Bridging HSR Trench	ea		0	\$0		
	21	Minor crossing closures	ea	\$151,702	2	\$303,405		
Building Items								
	1	Intermediate Passenger Stations						
		Norwalk LAUS-UP Santa Ana	ea	\$28,704,000	0	\$0		
		Norwalk LOSSAN Shared Use	ea	\$10,000,000	1	\$10,000,000		
		Fullerton LOSSAN Shared Use	ea	\$10,000,000	1	\$10,000,000		
		Anaheim LOSSAN Shared Use	ea	\$10,000,000	1	\$10,000,000		
		Santa Ana LOSSAN Shared Use	ea	\$10,000,000	1	\$10,000,000		
	2	Terminal Passenger Stations						
		LAX LAUS-LAX	ea	\$335,903,500	0	\$0		
		Anaheim LAUS-UP Santa Ana	ea	\$335,903,500	0	\$0		
		Irvine LOSSAN Shared Use	ea	\$10,000,000	1	\$10,000,000		
	3	Parking - Structure						
		Norwalk LAUS-UP Santa Ana	space	\$14,244	1140	\$16,238,160		
		Anaheim LAUS-UP Santa Ana	space	\$14,244	0	\$0		
		Anaheim LOSSAN Shared Use	space	\$14,244	1900	\$27,063,600		
		Irvine LOSSAN Shared Use	space	\$14,244	850	\$12,107,400		
	4	Parking - At Grade	space	\$2,042	0	\$0		
Rail and Utility Relocation								
	1	Single Track Relocation (Temporary)	km	\$1,083,588	0.000	\$0		
	2	Single Track Relocation (Permanent)	km	\$1,083,588	0.000	\$0		
	3	Single Track Removal	km	\$54,000	0.000	\$0		
	4	Major Utility Relocations - Dense Urban	km	\$758,511	0.000	\$0		
	5	Major Utility Relocations - Urban	km	\$579,719	69.256	\$40,149,054		
	6	Major Utility Relocations - Dense Suburban	km	\$406,345	0.000	\$0		
	7	Major Utility Relocations - Suburban	km	\$232,971	0.000	\$0		
	8	Major Utility Relocations - Undeveloped	km	\$11,919	0.000	\$0		
Right-of-Way								
	1	Right-of-Way Required for Each Segment						
		Dense Urban	Hectares	\$3,499,093	70.490	\$246,651,074		
		Urban	Hectares	\$2,332,729	0.000	\$0		
		Dense Suburban	Hectares	\$1,166,364	0.000	\$0		
		Suburban	Hectares	\$408,227	0.000	\$0		
		Undeveloped	Hectares	\$291,591	0.000	\$0		
	2	Right-of-Way Required for Passenger Station & Parking Facilities						
		Dense Urban	Hectares	\$3,499,093	40.800	\$142,762,999		
		Urban	Hectares	\$2,332,729	0.000	\$0		
		Dense Suburban	Hectares	\$1,166,364	0.000	\$0		
		Suburban	Hectares	\$408,227	0.000	\$0		
		Undeveloped	Hectares	\$291,591	0.000	\$0		
Environmental Mitigation								
	Environmental Mitigation			3% of Line Cost		\$33,314,530		\$3,527,180
Signals and Communication								
	1	Signaling (ATC)	km	\$720,586	69.256	\$49,904,898	48.4	\$34,876,358.46
	2	Communications (w/Fiber Optic Backbone)	km	\$595,973	69.256	\$41,274,728	48.4	\$28,845,108.50
	3	Wayside Protection System	km	\$57,213	69.256	\$3,962,374	48.4	\$2,769,130.42
Electrification Items								
	1	Traction Power Supply	km	\$368,420	69.256	\$25,515,286	48.4	\$17,831,521.62
	2	Traction Power Distribution	km	\$686,995	69.256	\$47,578,505	48.4	\$33,250,543.26
Vehicle Costs								
	1	Fleet size estimate	vehicles			\$0		
Support Facility Costs								
	1	Facility cost breakdown	ea			\$0		
Program Implementation Costs								
	Program Implementation Costs			25.5% of Total Cost and Procurement		\$390,969,297		\$30,880,460
Contingencies								
	Contingencies			25% of Total Construction Cost		\$383,303,232		\$30,274,961
Total Construction						\$1,110,484,324		\$117,572,662
Total Construction and Right of Way						\$1,533,212,928		\$121,099,842
Grand Total						\$2,307,485,456		\$1,189,413,456